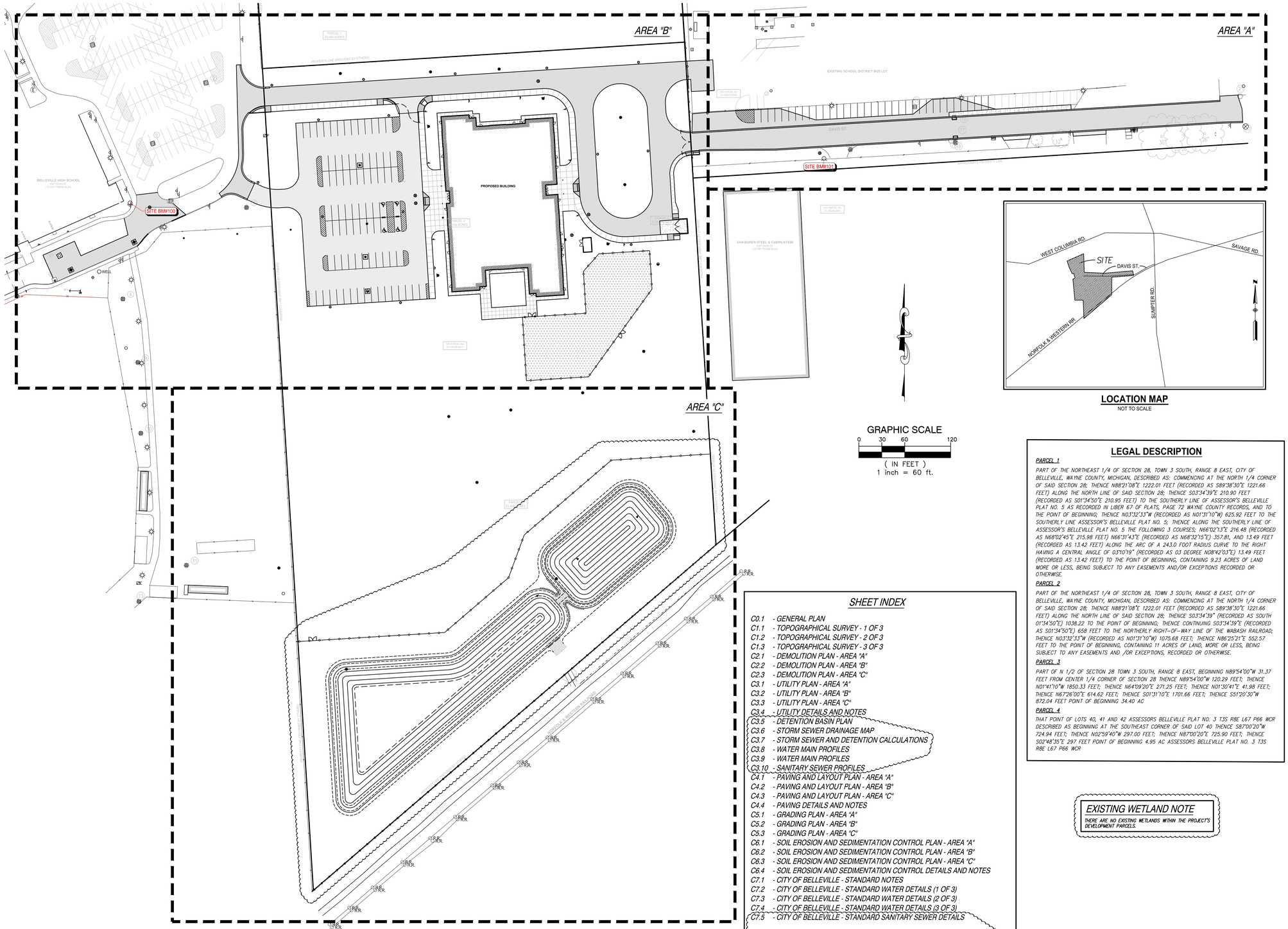

LOCATION MAP
NOT TO SCALE

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 inch = 60 ft.

LEGAL DESCRIPTION

PARCEL 1

PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 SOUTH, RANGE 8 EAST, CITY OF BELLEVILLE, WAYNE COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 28; THENCE N88°21'08"E 1222.01 FEET (RECORDED AS S89°38'30"E 1221.66 FEET) ALONG THE NORTH LINE OF SAID SECTION 28; THENCE S03°34'39"E 210.90 FEET (RECORDED AS S01°34'50"E 210.95 FEET) TO THE SOUTHERLY LINE OF ASSESSOR'S BELLEVILLE PLAT NO. 5 AS RECORDED IN LIBER 67 OF PLATS, PAGE 72 WAYNE COUNTY RECORDS, AND TO THE POINT OF BEGINNING; THENCE N03°32'33"W (RECORDED AS N01°31'10"W) 625.92 FEET TO THE SOUTHERLY LINE ASSESSOR'S BELLEVILLE PLAT NO. 5; THENCE ALONG THE SOUTHERLY LINE OF ASSESSOR'S BELLEVILLE PLAT NO. 5 THE FOLLOWING 3 COURSES; N66°02'13"E 216.48 (RECORDED AS N68°02'45"E 215.98 FEET) N66°31'43"E (RECORDED AS N68°32'15"E) 357.81, AND 13.49 FEET (RECORDED AS 13.42 FEET) ALONG THE ARC OF A 243.0 FOOT RADIUS CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 03°10'19" (RECORDED AS 03 DEGREE N08°42'03"E) 13.49 FEET (RECORDED AS 13.42 FEET) TO THE POINT OF BEGINNING, CONTAINING 9.23 ACRES OF LAND MORE OR LESS, BEING SUBJECT TO ANY EASEMENTS AND/OR EXCEPTIONS RECORDED OR OTHERWISE.

PARCEL 2

PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 SOUTH, RANGE 8 EAST, CITY OF BELLEVILLE, WAYNE COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 28; THENCE N88°21'08"E 1222.01 FEET (RECORDED AS S89°38'30"E 1221.66 FEET) ALONG THE NORTH LINE OF SAID SECTION 28; THENCE S03°34'39"E (RECORDED AS SOUTH 01°34'50"E) 1038.22 TO THE POINT OF BEGINNING; THENCE CONTINUING S03°34'39"E (RECORDED AS S01°34'50"E) 658 FEET TO THE NORTHERLY RIGHT-OF-WAY LINE OF THE WABASH RAILROAD; THENCE N03°32'33"W (RECORDED AS N01°31'10"W) 1075.68 FEET; THENCE N86°25'21"E 552.57 FEET TO THE POINT OF BEGINNING, CONTAINING 11 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO ANY EASEMENTS AND /OR EXCEPTIONS, RECORDED OR OTHERWISE.

PARCEL 3

PART OF N 1/2 OF SECTION 28 TOWN 3 SOUTH, RANGE 8 EAST, BEGINNING N89°54'00"W 31.37 FEET FROM CENTER 1/4 CORNER OF SECTION 28 THENCE N89°54'00"W 120.29 FEET; THENCE N01°41'10"W 1850.33 FEET; THENCE N64°09'20"E 271.25 FEET; THENCE N01°30'41"E 41.98 FEET; THENCE N67°26'00"E 614.62 FEET; THENCE S01°31'10"E 1701.66 FEET; THENCE S51°20'30"W 872.04 FEET POINT OF BEGINNING 34.40 AC

PARCEL 4

THAT POINT OF LOTS 40, 41 AND 42 ASSESSORS BELLEVILLE PLAT NO. 3 T3S R8E L67 P66 WCR DESCRIBED AS BEGINNING AT THE SOUTHEAST CORNER OF SAID LOT 40 THENCE S87°00'20"W 724.94 FEET; THENCE N02°59'40"W 297.00 FEET; THENCE N87°00'20"E 725.90 FEET; THENCE S02°48'35"E 297 FEET POINT OF BEGINNING 4.95 AC ASSESSORS BELLEVILLE PLAT NO. 3 T3S R8E L67 P66 WCR

SHEET INDEX

EXISTING WETLAND NOTE

THERE ARE NO EXISTING WETLANDS WITHIN THE PROJECT'S DEVELOPMENT PARCELS.

OWNER

VAN BUREN PUBLIC SCHOOLS
555 W. COLUMBIA AVE.
BELLEVILLE, MI 48111
PHONE: (734) 697-9123
FAX: (734) 697-6385

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Van Buren Public Schools

The Early Childhood Development Center

Davis St.
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Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
Q.M. Review	T. Sovel
Approved	T. Sovel
Drawing Scale	As Noted

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IDS Drawing Title

General Plan
Overall

ISSUED FOR REFERENCE ONLY

IDS Project Number
20111-1000
SDA Project No. NP20062

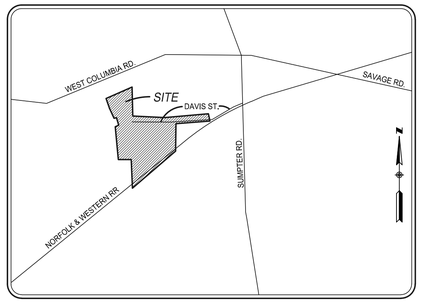
Drawing Number
C0.1

BENCHMARK DESCRIPTIONS

DATUM: GPS-DERIVED NAVD'88

SITE BM#100 — ARROW ON HYDRANT AT THE SOUTHEAST CORNER OF BELLEVILLE HIGH SCHOOL. ±" FROM BACK OF CURB.
ELEV.=679.69

SITE BM#101 — ARROW ON HYDRANT SOUTH SIDE OF DAVIS ST. , LOCATED IN FRONT OF VAN BUREN STEEL & FABRICATING BUILDING #327 DAVIS ST.
ELEV.=679.60



LOCATION MAP
NOT TO SCALE

SURVEYOR'S COMMENTS

1. THIS TOPOGRAPHICAL MAP IS BASED UPON A FIELD SURVEY PERFORMED BY SPALDING DEDECKER DURING APRIL OF 2020.
2. THE PROPERTY LINES SHOWN ON THIS TOPOGRAPHICAL SURVEY ARE INTENDED TO BE AN APPROXIMATE GRAPHICAL REPRESENTATION BASED UPON THE PROVIDED SURVEY BY HENNESSEY ENGINEERS, INC., HOLDING FOUND PROPERTY IRONS FROM THE SURVEY. A COMPLETE PROPERTY LINE ANALYSIS HAS NOT BEEN PERFORMED AND PROPERTY CORNERS HAVE NOT BEEN SET IN THE FIELD PER THE AGREED TO SCOPE OF SERVICES. THE SOUTH LINE OF THE BUS GARAGE PARCEL IS DRAWN BASED ON THE TAX DESCRIPTION AND THE ASSESSOR'S BELLEVILLE PLAT NO. 3 AS RECORDED IN LIBER 67 PAGE 66 OF PLATS. SAID TAX DESCRIPTION WAS THEN ROTATED TO FIT THE PROVIDED SURVEY BY HENNESSEY ENGINEERS, INC.
3. THIS SURVEY HAS BEEN PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE SEARCH AND THEREFORE THIS PROPERTY MAY BE SUBJECT TO EASEMENTS, RIGHT-OF-WAY TAKINGS AND RESTRICTIVE COVENANTS THAT COULD ENCUMBER THIS PARCEL OF LAND.
4. THE BEARING BASE AND COORDINATES OF THIS DRAWING ARE BASED UPON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83, INTERNATIONAL FEET, 2011 ADJUSTMENT. CONTROL WAS ESTABLISHED BY GPS OBSERVATION USING THE AVAILABLE MDOT CONTINUOUSLY OPERATING STATIONS (CORS).
5. THE VERTICAL DATUM OF THIS SURVEY IS BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988. CONTROL WAS ESTABLISHED BY GPS OBSERVATION USING THE AVAILABLE MDOT CONTINUOUSLY OPERATION STATIONS (CORS).
6. THE UTILITY INFORMATION SHOWN ON THIS SURVEY IS BASED UPON A COMBINATION OF RECORD INFORMATION AND FIELD MEASUREMENTS. A MISS DIG DESIGN TICKET NUMBER OF A081200546-00A HAS BEEN REFERENCED TO THIS PROJECT AND A UTILITY PROVIDER CHART IS SHOWN ON THIS DRAWING. THERE ARE NO ASSURANCES THAT ALL PROVIDERS HAVE RESPONDED AND THE SURVEYOR DOES NOT GUARANTEE THAT ALL UNDERGROUND UTILITIES ARE SHOWN AND/OR POSITIONED PROPERLY ON THIS DRAWING DUE TO AMBIGUOUS PLANS AND RECORDS PROVIDED TO US. THE INFORMATION SHOWN ON THIS DRAWING IS INTENDED TO BE USED AS A GUIDE FOR POSSIBLE UNDERGROUND UTILITY CONFLICTS. IT IS THE RESPONSIBILITY OF OTHERS TO RESOLVE THE ACTUAL LOCATION OF ANY UNDERGROUND UTILITY THROUGH THE MISS DIG FIELD VERIFICATION SYSTEM PRIOR TO ANY SITE EXCAVATION. CALL 811 OR 800-482-7171.

BELLEVILLE HIGH SCHOOL
#327 DAVIS ST.
1 STORY FRAME BLDG.

PARCEL 1
23.456 ACRES

PARCEL 2
23,456 ACRES

TAX PARCEL No.
31-109-99-0001

PROPERTY LINE (PROVIDED BY OTHERS)

DAVIS ST.
ASPH.

SITE BM#100

SDA#10 BACKSIGHT
SDA#15
SDA#12
SDA#

SB# B-1
SB# B-2
SB# B-3
SB# B-4
SB# B-5
SB# B-7
SB# B-8

0' 30' 60'
SCALE: 1" = 30'

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IDS Drawing Title

Topographical Survey
1 of 3

IDS Project Number
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Drawing Number
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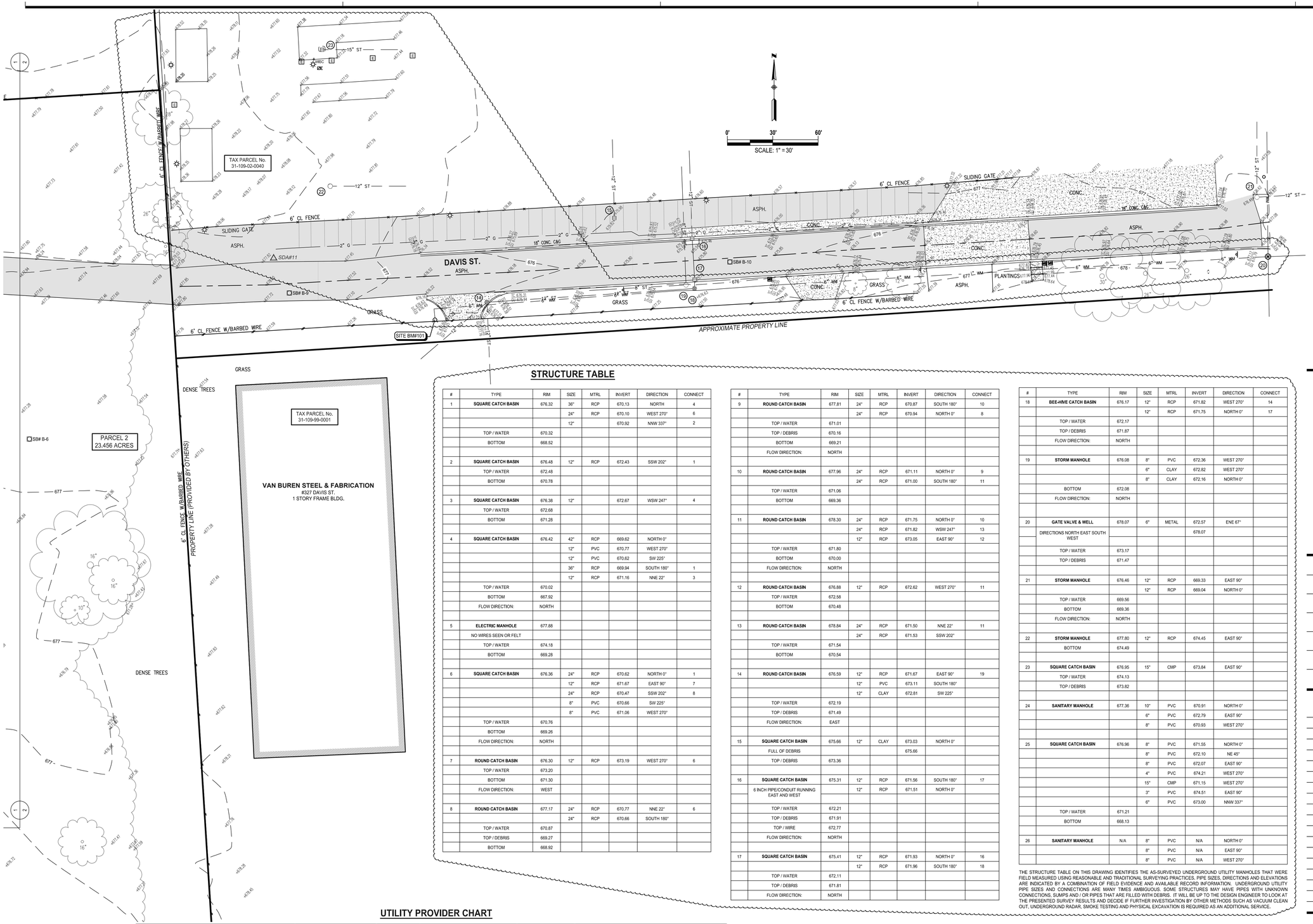

STRUCTURE TABLE

#	TYPE	RIM	SIZE	MTRL	INVERT	DIRECTION	CONNECT
1	**SQUARE CATCH BASIN**	676.32	36"	RCP	670.13	NORTH	4
			24"	RCP	670.10	WEST 270°	6
			12"		670.92	NNW 337°	2
	TOP / WATER	670.32					
	BOTTOM	668.52					
2	**SQUARE CATCH BASIN**	676.48	12"	RCP	672.43	SSW 202°	1
	TOP / WATER	672.48					
	BOTTOM	670.78					
3	**SQUARE CATCH BASIN**	676.38	12"		672.67	WSW 247°	4
	TOP / WATER	672.68					
	BOTTOM	671.28					
4	**SQUARE CATCH BASIN**	676.42	42"	RCP	669.62	NORTH 0°	
			12"	PVC	670.77	WEST 270°	
			12"	PVC	670.62	SW 225°	
			36"	RCP	669.94	SOUTH 180°	1
			12"	RCP	671.16	NNE 22°	3
	TOP / WATER	670.02					
	BOTTOM	667.92					
	FLOW DIRECTION:	NORTH					
5	**ELECTRIC MANHOLE**	677.88					
	NO WIRES SEEN OR FELT						
	TOP / WATER	674.18					
	BOTTOM	669.28					
6	**SQUARE CATCH BASIN**	676.36	24"	RCP	670.62	NORTH 0°	1
			12"	RCP	671.67	EAST 90°	7
			24"	RCP	670.47	SSW 202°	8
			8"	PVC	670.66	SW 225°	
			8"	PVC	671.06	WEST 270°	
	TOP / WATER	670.76					
	BOTTOM	669.26					
	FLOW DIRECTION:	NORTH					
7	**ROUND CATCH BASIN**	676.30	12"	RCP	673.19	WEST 270°	6
	TOP / WATER	673.20					
	BOTTOM	671.30					
	FLOW DIRECTION:	WEST					
8	**ROUND CATCH BASIN**	677.17	24"	RCP	670.77	NNE 22°	6
			24"	RCP	670.66	SOUTH 180°	
	TOP / WATER	670.87					
	TOP / DEBRIS	669.27					
	BOTTOM	668.92					

#	TYPE	RIM	SIZE	MTRL	INVERT	DIRECTION	CONNECT
9	**ROUND CATCH BASIN**	677.81	24"	RCP	670.87	SOUTH 180°	10
			24"	RCP	670.94	NORTH 0°	8
	TOP / WATER	671.01					
	TOP / DEBRIS	670.16					
	BOTTOM	669.21					
	FLOW DIRECTION:	NORTH					
10	**ROUND CATCH BASIN**	677.96	24"	RCP	671.11	NORTH 0°	9
			24"	RCP	671.00	SOUTH 180°	11
	TOP / WATER	671.06					
	BOTTOM	669.36					
11	**ROUND CATCH BASIN**	678.30	24"	RCP	671.75	NORTH 0°	10
			24"	RCP	671.82	WSW 247°	13
			12"	RCP	673.05	EAST 90°	12
	TOP / WATER	671.80					
	BOTTOM	670.00					
	FLOW DIRECTION:	NORTH					
12	**ROUND CATCH BASIN**	676.88	12"	RCP	672.62	WEST 270°	11
	TOP / WATER	672.58					
	BOTTOM	670.48					
13	**ROUND CATCH BASIN**	678.84	24"	RCP	671.50	NNE 22°	11
			24"	RCP	671.53	SSW 202°	
	TOP / WATER	671.54					
	BOTTOM	670.54					
14	**ROUND CATCH BASIN**	676.59	12"	RCP	671.67	EAST 90°	19
			12"	PVC	673.11	SOUTH 180°	
			12"	CLAY	672.81	SW 225°	
	TOP / WATER	672.19					
	TOP / DEBRIS	671.49					
	FLOW DIRECTION:	EAST					
15	**SQUARE CATCH BASIN**	675.66	12"	CLAY	673.03	NORTH 0°	
	FULL OF DEBRIS				675.66		
	TOP / DEBRIS	673.36					
16	**SQUARE CATCH BASIN**	675.31	12"	RCP	671.56	SOUTH 180°	17
	6 INCH PIPE/CONDUIT RUNNING EAST AND WEST		12"	RCP	671.51	NORTH 0°	
	TOP / WATER	672.21					
	TOP / DEBRIS	671.91					
	TOP / WIRE	672.77					
	FLOW DIRECTION:	NORTH					
17	**SQUARE CATCH BASIN**	675.41	12"	RCP	671.93	NORTH 0°	16
			12"	RCP	671.96	SOUTH 180°	18
	TOP / WATER	672.11					
	TOP / DEBRIS	671.81					
	FLOW DIRECTION:	NORTH					

#	TYPE	RIM	SIZE	MTRL	INVERT	DIRECTION	CONNECT
18	**BEE-HIVE CATCH BASIN**	676.17	12"	RCP	671.82	WEST 270°	14
			12"	RCP	671.75	NORTH 0°	17
	TOP / WATER	672.17					
	TOP / DEBRIS	671.87					
	FLOW DIRECTION:	NORTH					
19	**STORM MANHOLE**	676.08	8"	PVC	672.36	WEST 270°	
			6"	CLAY	672.82	WEST 270°	
			8"	CLAY	672.16	NORTH 0°	
	BOTTOM	672.08					
	FLOW DIRECTION:	NORTH					
20	**GATE VALVE & WELL**	676.07	6"	METAL	672.57	ENE 67°	
	DIRECTIONS NORTH EAST SOUTH WEST				678.07		
	TOP / WATER	673.17					
	TOP / DEBRIS	671.47					
21	**STORM MANHOLE**	676.46	12"	RCP	669.33	EAST 90°	
			12"	RCP	669.04	NORTH 0°	
	TOP / WATER	669.56					
	BOTTOM	669.36					
	FLOW DIRECTION:	NORTH					
22	**STORM MANHOLE**	677.80	12"	RCP	674.45	EAST 90°	
	BOTTOM	674.49					
23	**SQUARE CATCH BASIN**	676.95	15"	CMP	673.84	EAST 90°	
	TOP / WATER	674.13					
	TOP / DEBRIS	673.82					
24	**SANITARY MANHOLE**	677.36	10"	PVC	670.91	NORTH 0°	
			6"	PVC	672.79	EAST 90°	
			8"	PVC	670.93	WEST 270°	
25	**SQUARE CATCH BASIN**	676.96	8"	PVC	671.55	NORTH 0°	
			8"	PVC	672.10	NE 45°	
			8"	PVC	672.07	EAST 90°	
			4"	PVC	674.21	WEST 270°	
			15"	CMP	671.15	WEST 270°	
			3"	PVC	674.51	EAST 90°	
			6"	PVC	673.00	NNW 337°	
	TOP / WATER	671.21					
	BOTTOM	668.13					
26	**SANITARY MANHOLE**	N/A	8"	PVC	N/A	NORTH 0°	
			8"	PVC	N/A	EAST 90°	
			8"	PVC	N/A	WEST 270°	

THE STRUCTURE TABLE ON THIS DRAWING IDENTIFIES THE AS-SURVEYED UNDERGROUND UTILITY MANHOLES THAT WERE FIELD MEASURED USING REASONABLE AND TRADITIONAL SURVEYING PRACTICES. PIPE SIZES, DIRECTIONS AND ELEVATIONS ARE INDICATED BY A COMBINATION OF FIELD EVIDENCE AND AVAILABLE RECORD INFORMATION. UNDERGROUND UTILITY PIPE SIZES AND CONNECTIONS ARE MANY TIMES AMBIGUOUS. SOME STRUCTURES MAY HAVE PIPES WITH UNKNOWN CONNECTIONS, SUMPS AND / OR PIPES THAT ARE FILLED WITH DEBRIS. IT WILL BE UP TO THE DESIGN ENGINEER TO LOOK AT THE PRESENTED SURVEY RESULTS AND DECIDE IF FURTHER INVESTIGATION BY OTHER METHODS SUCH AS VACUUM CLEAN OUT, UNDERGROUND RADAR, SMOKE TESTING AND PHYSICAL EXCAVATION IS REQUIRED AS AN ADDITIONAL SERVICE.

UTILITY PROVIDER CHART

UTILITY PROVIDER	MISS-DIG RESULTS	DATE	CONTACT	CONTACT #	CONTACT EMAIL
BP-AMOCO PIPELINE CO	NOT YET RECEIVED	4/22/2020	BOBBY ROYE	800-548-6482	MITICKETS@DIGTRACK.COM
ATT	RECEIVED	4/14/2020	LINDA DENNISUK	248-456-8256	ld2154@att.com
BELLEVILLE CITY	NOT YET RECEIVED	4/22/2020	KEITH TACKETT	734-697-9323	DPS@BELLEVILLE.MI.US
COMCAST	RECEIVED	4/17/2020	CRAIG PUDAS	248-809-2715	CRAIG_PUDAS@CABLE.COMCAST.COM
DETROIT EDISON	NOT YET RECEIVED	4/22/2020	NOT PROVIDED	313-235-5632	Design_MissDig@DTEenergy.com
ENBRIDGE ENERGY PARTNERS, L.P.	RECEIVED	4/13/2020	JIM SCHOTT	269-781-4434	JIM.SCHOTT@ENBRIDGE.COM
DTE GAS DISTRIBUTION	RECEIVED	4/14/2020	BARBARA SAUNDERS	313-235-5111	SAUNDERSB@DTEENERGY.COM
VAN BUREN TOWNSHIP	NOT YET RECEIVED	4/22/2020	MARTY LADD	734-699-8900	MLADD@VANBUREN-MI.ORG
WOLVERINE PIPELINE CO	RECEIVED	4/14/2020	LOUIS KRAUS	269-323-2491	LOUIS_KRAUS@WPLCO.COM

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IDS Drawing Title

Topographical Survey
2 of 3

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20111-1000
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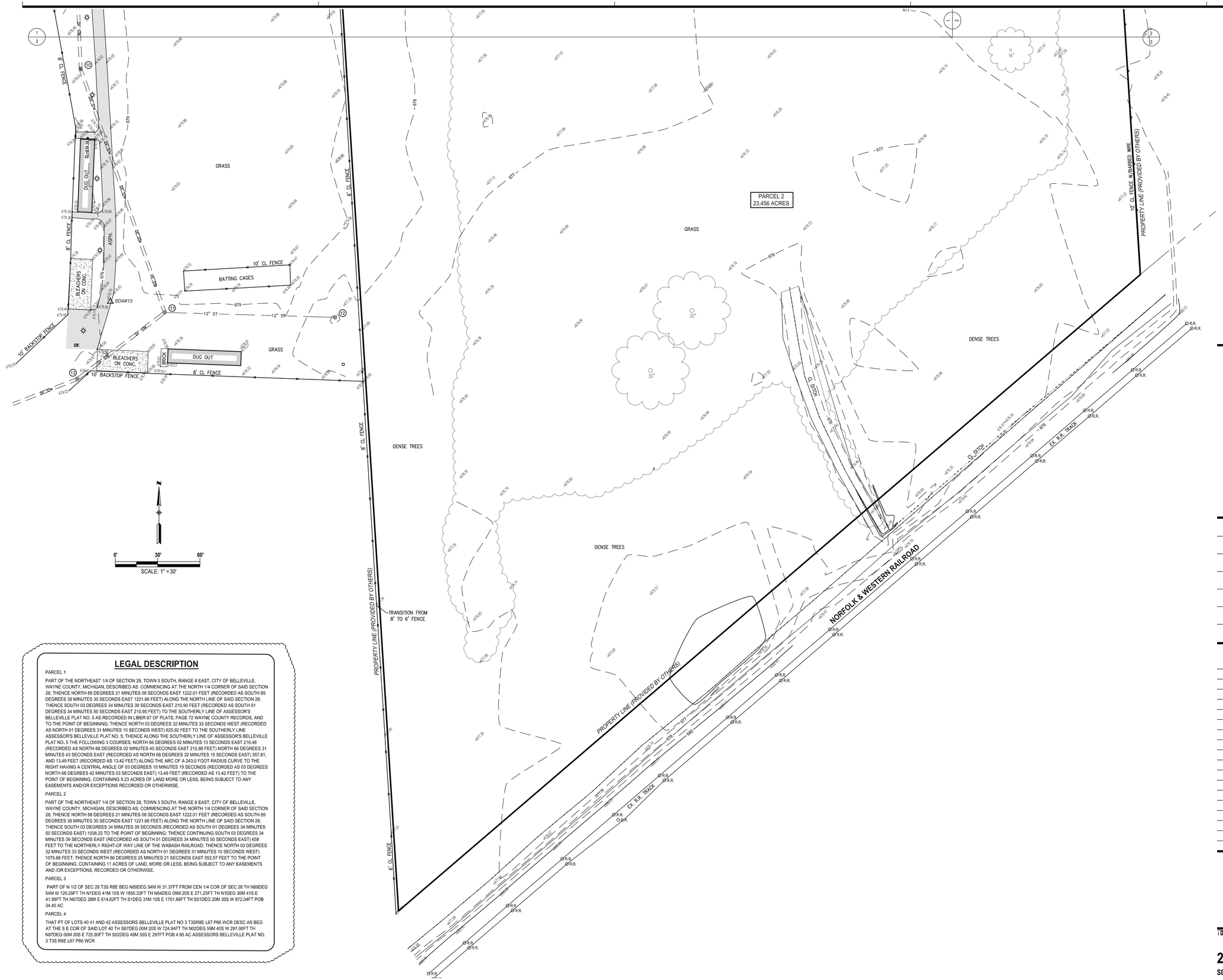
C1.2



LEGAL DESCRIPTION

PARCEL 1

PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 SOUTH, RANGE 8 EAST, CITY OF BELLEVILLE, WAYNE COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 28; THENCE NORTH 88 DEGREES 21 MINUTES 08 SECONDS EAST 1222.01 FEET (RECORDED AS SOUTH 89 DEGREES 38 MINUTES 30 SECONDS EAST 1221.66 FEET) ALONG THE NORTH LINE OF SAID SECTION 28; THENCE SOUTH 03 DEGREES 34 MINUTES 39 SECONDS EAST 210.90 FEET (RECORDED AS SOUTH 01 DEGREES 34 MINUTES 50 SECONDS EAST 210.95 FEET) TO THE SOUTHERLY LINE OF ASSESSOR'S BELLEVILLE PLAT NO. 5 AS RECORDED IN LIBER 67 OF PLATS, PAGE 72 WAYNE COUNTY RECORDS, AND TO THE POINT OF BEGINNING; THENCE NORTH 03 DEGREES 32 MINUTES 33 SECONDS WEST (RECORDED AS NORTH 01 DEGREES 31 MINUTES 10 SECONDS WEST) 625.92 FEET TO THE SOUTHERLY LINE ASSESSOR'S BELLEVILLE PLAT NO. 5; THENCE ALONG THE SOUTHERLY LINE OF ASSESSOR'S BELLEVILLE PLAT NO., 5 THE FOLLOWING 3 COURSES; NORTH 66 DEGREES 02 MINUTES 13 SECONDS EAST 216.48 (RECORDED AS NORTH 68 DEGREES 02 MINUTES 45 SECONDS EAST 215.98 FEET) NORTH 66 DEGREES 31 MINUTES 43 SECONDS EAST (RECORDED AS NORTH 68 DEGREES 32 MINUTES 15 SECONDS EAST) 357.81, AND 13.49 FEET (RECORDED AS 13.42 FEET) ALONG THE ARC OF A 243.0 FOOT RADIUS CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 03 DEGREES 10 MINUTES 19 SECONDS (RECORDED AS 03 DEGREES NORTH 68 DEGREES 42 MINUTES 03 SECONDS EAST) 13.49 FEET (RECORDED AS 13.42 FEET) TO THE POINT OF BEGINNING, CONTAINING 9.23 ACRES OF LAND MORE OR LESS, BEING SUBJECT TO ANY EASEMENTS AND/OR EXCEPTIONS RECORDED OR OTHERWISE.

PARCEL 2

PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 SOUTH, RANGE 8 EAST, CITY OF BELLEVILLE, WAYNE COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 28; THENCE NORTH 88 DEGREES 21 MINUTES 08 SECONDS EAST 1222.01 FEET (RECORDED AS SOUTH 89 DEGREES 38 MINUTES 30 SECONDS EAST 1221.66 FEET) ALONG THE NORTH LINE OF SAID SECTION 28; THENCE SOUTH 03 DEGREES 34 MINUTES 39 SECONDS (RECORDED AS SOUTH 01 DEGREES 34 MINUTES 50 SECONDS EAST) 1038.22 TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 03 DEGREES 34 MINUTES 39 SECONDS EAST (RECORDED AS SOUTH 01 DEGREES 34 MINUTES 50 SECONDS EAST) 658 FEET TO THE NORTHERLY RIGHT-OF WAY LINE OF THE WABASH RAILROAD; THENCE NORTH 03 DEGREES 32 MINUTES 33 SECONDS WEST (RECORDED AS NORTH 01 DEGREES 31 MINUTES 10 SECONDS WEST) 1075.68 FEET; THENCE NORTH 86 DEGREES 25 MINUTES 21 SECONDS EAST 552.57 FEET TO THE POINT OF BEGINNING, CONTAINING 11 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO ANY EASEMENTS AND /OR EXCEPTIONS, RECORDED OR OTHERWISE.

PARCEL 3

PART OF N 1/2 OF SEC 28 T3S R8E BEG N89DEG 54M W 31.37FT FROM CEN 1/4 COR OF SEC 28 TH N89DEG 54M W 120.29FT TH N1DEG 41M 10S W 1850.33FT TH N64DEG 09M 20S E 271.25FT TH N1DEG 30M 41S E 41.98FT TH N67DEG 26M E 614.62FT TH S1DEG 31M 10S E 1701.66FT TH S51DEG 20M 30S W 872.04FT POB 34.40 AC

PARCEL 4

THAT PT OF LOTS 40 41 AND 42 ASSESSORS BELLEVILLE PLAT NO 3 T3SR8E L67 P66 WCR DESC AS BEG AT THE S E COR OF SAID LOT 40 TH S87DEG 00M 20S W 724.94FT TH N02DEG 59M 40S W 297.00FT TH N87DEG 00M 20S E 725.90FT TH S02DEG 48M 35S E 297FT POB 4.95 AC ASSESSORS BELLEVILLE PLAT NO. 3 T3S R8E L67 P66 WCR

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Project Title

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The Early Childhood Development Center

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Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
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Drawing Scale	As Noted

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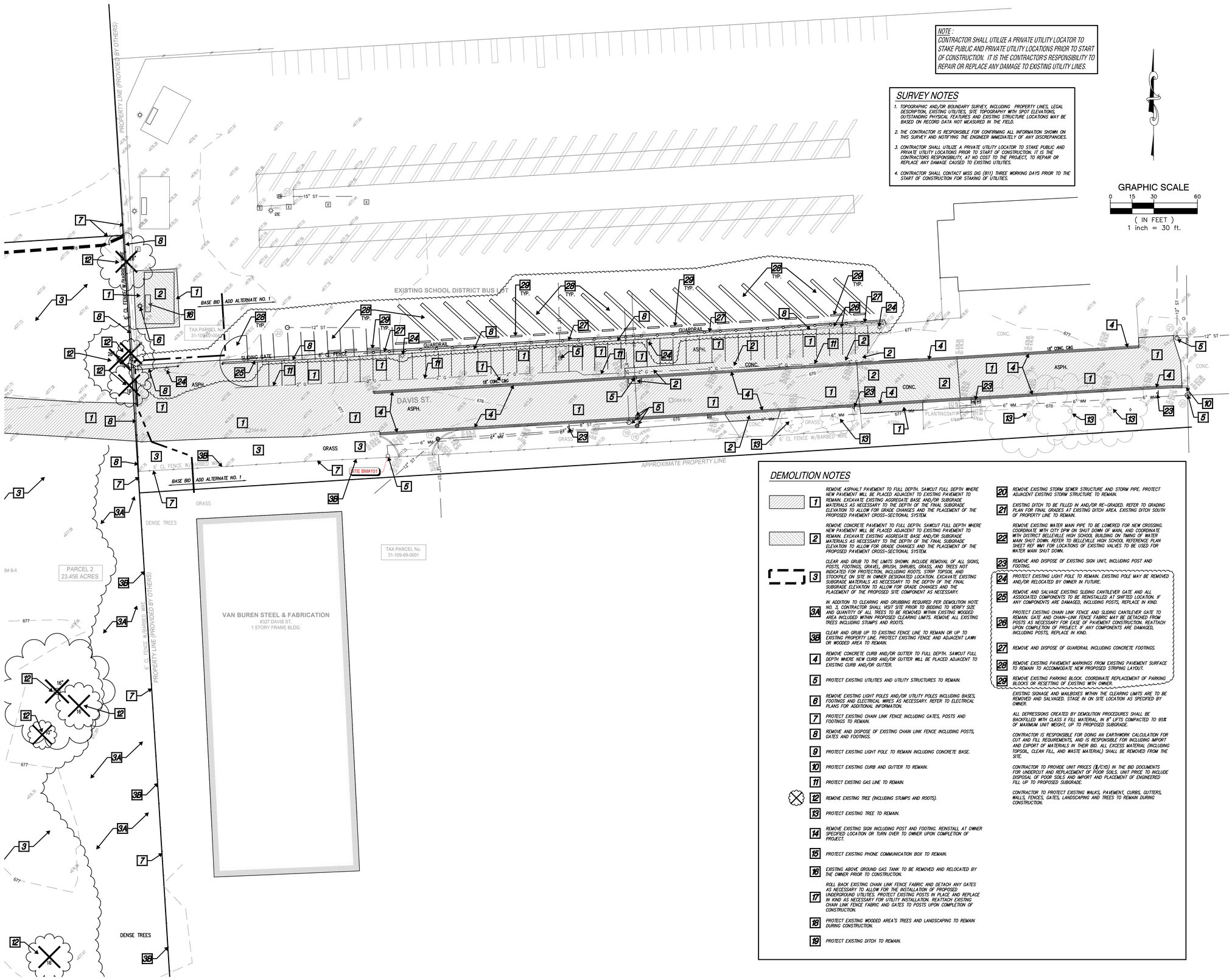
IDS Drawing Title

Topographical Survey
3 of 3

IDS Project Number: 20111-1000
SDA Project No. NP20062

Drawing Number: C1.3



NOTE :
CONTRACTOR SHALL UTILIZE A PRIVATE UTILITY LOCATOR TO STAKE PUBLIC AND PRIVATE UTILITY LOCATIONS PRIOR TO START OF CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPAIR OR REPLACE ANY DAMAGE TO EXISTING UTILITY LINES.

SURVEY NOTES

1. TOPOGRAPHIC AND/OR BOUNDARY SURVEY, INCLUDING PROPERTY LINES, LEGAL DESCRIPTION, EXISTING UTILITIES, SITE TOPOGRAPHY WITH SPOT ELEVATIONS, OUTSTANDING PHYSICAL FEATURES AND EXISTING STRUCTURE LOCATIONS MAY BE BASED ON RECORD DATA NOT MEASURED IN THE FIELD.
2. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING ALL INFORMATION SHOWN ON THIS SURVEY AND NOTIFYING THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
3. CONTRACTOR SHALL UTILIZE A PRIVATE UTILITY LOCATOR TO STAKE PUBLIC AND PRIVATE UTILITY LOCATIONS PRIOR TO START OF CONSTRUCTION. IT IS THE CONTRACTORS RESPONSIBILITY, AT NO COST TO THE PROJECT, TO REPAIR OR REPLACE ANY DAMAGE CAUSED TO EXISTING UTILITIES.
4. CONTRACTOR SHALL CONTACT MISS DIG (811) THREE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION FOR STAKING OF UTILITIES.

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

DEMOLITION NOTES

1. REMOVE ASPHALT PAVEMENT TO FULL DEPTH. SAWCUT FULL DEPTH WHERE NEW PAVEMENT WILL BE PLACED ADJACENT TO EXISTING PAVEMENT TO REMAIN. EXCAVATE EXISTING AGGREGATE BASE AND/OR SUBGRADE MATERIALS AS NECESSARY TO THE DEPTH OF THE FINAL SUBGRADE ELEVATION TO ALLOW FOR GRADE CHANGES AND THE PLACEMENT OF THE PROPOSED PAVEMENT CROSS-SECTIONAL SYSTEM.
2. REMOVE CONCRETE PAVEMENT TO FULL DEPTH. SAWCUT FULL DEPTH WHERE NEW PAVEMENT WILL BE PLACED ADJACENT TO EXISTING PAVEMENT TO REMAIN. EXCAVATE EXISTING AGGREGATE BASE AND/OR SUBGRADE MATERIALS AS NECESSARY TO THE DEPTH OF THE FINAL SUBGRADE ELEVATION TO ALLOW FOR GRADE CHANGES AND THE PLACEMENT OF THE PROPOSED PAVEMENT CROSS-SECTIONAL SYSTEM.
3. CLEAR AND GRUB TO THE LIMITS SHOWN. INCLUDE REMOVAL OF ALL SIGNS, POSTS, FOOTINGS, GRAVEL, BRUSH, SHRUBS, GRASS, AND TREES NOT INDICATED FOR PROTECTION, INCLUDING ROOTS. STRIP TOPSOIL AND STOCKPILE ON SITE IN OWNER DESIGNATED LOCATION. EXCAVATE EXISTING SUBGRADE MATERIALS AS NECESSARY TO THE DEPTH OF THE FINAL SUBGRADE ELEVATION TO ALLOW FOR GRADE CHANGES AND THE PLACEMENT OF THE PROPOSED SITE COMPONENT AS NECESSARY.

   IN ADDITION TO CLEARING AND GRUBBING REQUIRED PER DEMOLITION NOTE NO. 3, CONTRACTOR SHALL VISIT SITE PRIOR TO BIDDING TO VERIFY SIZE AND QUANTITY OF ALL TREES TO BE REMOVED WITHIN EXISTING WOODED AREA INCLUDED WITHIN PROPOSED CLEARING LIMITS. REMOVE ALL EXISTING TREES INCLUDING STUMPS AND ROOTS.

3A. CLEAR AND GRUB UP TO EXISTING FENCE LINE TO REMAIN OR UP TO EXISTING PROPERTY LINE. PROTECT EXISTING FENCE AND ADJACENT LAWN OR WOODED AREA TO REMAIN.

3B. REMOVE CONCRETE CURB AND/OR GUTTER TO FULL DEPTH. SAWCUT FULL DEPTH WHERE NEW CURB AND/OR GUTTER WILL BE PLACED ADJACENT TO EXISTING CURB AND/OR GUTTER.

4. PROTECT EXISTING UTILITIES AND UTILITY STRUCTURES TO REMAIN.
5. REMOVE EXISTING LIGHT POLES AND/OR UTILITY POLES INCLUDING BASES, FOOTINGS AND ELECTRICAL WIRES AS NECESSARY. REFER TO ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
6. PROTECT EXISTING CHAIN LINK FENCE INCLUDING GATES, POSTS AND FOOTINGS TO REMAIN.
7. REMOVE AND DISPOSE OF EXISTING CHAIN LINK FENCE INCLUDING POSTS, GATES AND FOOTINGS.
8. PROTECT EXISTING LIGHT POLE TO REMAIN INCLUDING CONCRETE BASE.
9. PROTECT EXISTING CURB AND GUTTER TO REMAIN.
10. PROTECT EXISTING GAS LINE TO REMAIN.
11. REMOVE EXISTING TREE (INCLUDING STUMPS AND ROOTS).
12. PROTECT EXISTING TREE TO REMAIN.
13. REMOVE EXISTING SIGN INCLUDING POST AND FOOTING. REINSTALL AT OWNER SPECIFIED LOCATION OR TURN OVER TO OWNER UPON COMPLETION OF PROJECT.
14. PROTECT EXISTING PHONE COMMUNICATION BOX TO REMAIN.
15. EXISTING ABOVE GROUND GAS TANK TO BE REMOVED AND RELOCATED BY THE OWNER PRIOR TO CONSTRUCTION.
16. ROLL BACK EXISTING CHAIN LINK FENCE FABRIC AND DETACH ANY GATES AS NECESSARY TO ALLOW FOR THE INSTALLATION OF PROPOSED UNDERGROUND UTILITIES. PROTECT EXISTING POSTS IN PLACE AND REPLACE IN KIND AS NECESSARY FOR UTILITY INSTALLATION. REATTACH EXISTING CHAIN LINK FENCE FABRIC AND GATES TO POSTS UPON COMPLETION OF CONSTRUCTION.
17. PROTECT EXISTING WOODED AREA'S TREES AND LANDSCAPING TO REMAIN DURING CONSTRUCTION.
18. PROTECT EXISTING DITCH TO REMAIN.
19. REMOVE EXISTING STORM SEWER STRUCTURE AND STORM PIPE. PROTECT ADJACENT EXISTING STORM STRUCTURE TO REMAIN.
20. EXISTING DITCH TO BE FILLED IN AND/OR RE-GRADED. REFER TO GRADING PLAN FOR FINAL GRADES AT EXISTING DITCH AREA. EXISTING DITCH SOUTH OF PROPERTY LINE TO REMAIN.
21. REMOVE EXISTING WATER MAIN PIPE TO BE LOWERED FOR NEW CROSSING. COORDINATE WITH CITY DPW ON SHUT DOWN OF MAIN, AND COORDINATE WITH DISTRICT BELLEVILLE HIGH SCHOOL BUILDING ON TIMING OF WATER MAIN SHUT DOWN. REFER TO BELLEVILLE HIGH SCHOOL REFERENCE PLAN SHEET REF. WM1 FOR LOCATIONS OF EXISTING VALVES TO BE USED FOR WATER MAIN SHUT DOWN.
22. REMOVE AND DISPOSE OF EXISTING SIGN UNIT, INCLUDING POST AND FOOTING.
23. PROTECT EXISTING LIGHT POLE TO REMAIN. EXISTING POLE MAY BE REMOVED AND/OR RELOCATED BY OWNER IN FUTURE.
24. REMOVE AND SALVAGE EXISTING SLIDING CANTILEVER GATE AND ALL ASSOCIATED COMPONENTS TO BE REINSTALLED AT SHIFTED LOCATION. IF ANY COMPONENTS ARE DAMAGED, INCLUDING POSTS, REPLACE IN KIND.
25. PROTECT EXISTING CHAIN LINK FENCE AND SLIDING CANTILEVER GATE TO REMAIN. GATE AND CHAIN-LINK FENCE FABRIC MAY BE DETACHED FROM POSTS AS NECESSARY FOR EASE OF PAVEMENT CONSTRUCTION. REATTACH UPON COMPLETION OF PROJECT. IF ANY COMPONENTS ARE DAMAGED, INCLUDING POSTS, REPLACE IN KIND.
26. REMOVE AND DISPOSE OF GUARDRAIL INCLUDING CONCRETE FOOTINGS.
27. REMOVE EXISTING PAVEMENT MARKINGS FROM EXISTING PAVEMENT SURFACE TO REMAIN TO ACCOMMODATE NEW PROPOSED STRIPING LAYOUT.
28. REMOVE EXISTING PARKING BLOCK. COORDINATE REPLACEMENT OF PARKING BLOCKS OR RESETTING OF EXISTING WITH OWNER.
29. EXISTING SIGNAGE AND MAILBOXES WITHIN THE CLEARING LIMITS ARE TO BE REMOVED AND SALVAGED. STAGE IN ON SITE LOCATION AS SPECIFIED BY OWNER.

ALL DEPRESSIONS CREATED BY DEMOLITION PROCEDURES SHALL BE BACKFILLED WITH CLASS II FILL MATERIAL, IN 8" LIFTS COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT, UP TO PROPOSED SUBGRADE.

CONTRACTOR IS RESPONSIBLE FOR DOING AN EARTHWORK CALCULATION FOR CUT AND FILL REQUIREMENTS, AND IS RESPONSIBLE FOR INCLUDING IMPORT AND EXPORT OF MATERIALS IN THEIR BID. ALL EXCESS MATERIAL (INCLUDING TOPSOIL, CLEAN FILL, AND WASTE MATERIAL) SHALL BE REMOVED FROM THE SITE.

CONTRACTOR TO PROVIDE UNIT PRICES ($/CY) IN THE BID DOCUMENTS FOR UNDERCUT AND REPLACEMENT OF POOR SOILS. UNIT PRICE TO INCLUDE DISPOSAL OF POOR SOILS AND IMPORT AND PLACEMENT OF ENGINEERED FILL UP TO PROPOSED SUBGRADE.

CONTRACTOR TO PROTECT EXISTING WALKS, PAVEMENT, CURBS, GUTTERS, WALLS, FENCES, GATES, LANDSCAPING AND TREES TO REMAIN DURING CONSTRUCTION.

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Project Title

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Project Designer	J. Ensley
Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
Q.M. Review	T. Sovel
Approved	T. Sovel
Drawing Scale	As Noted

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Bulletin No. 1 Revised	12-08-2020
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Bulletin No. 8	09-28-2021

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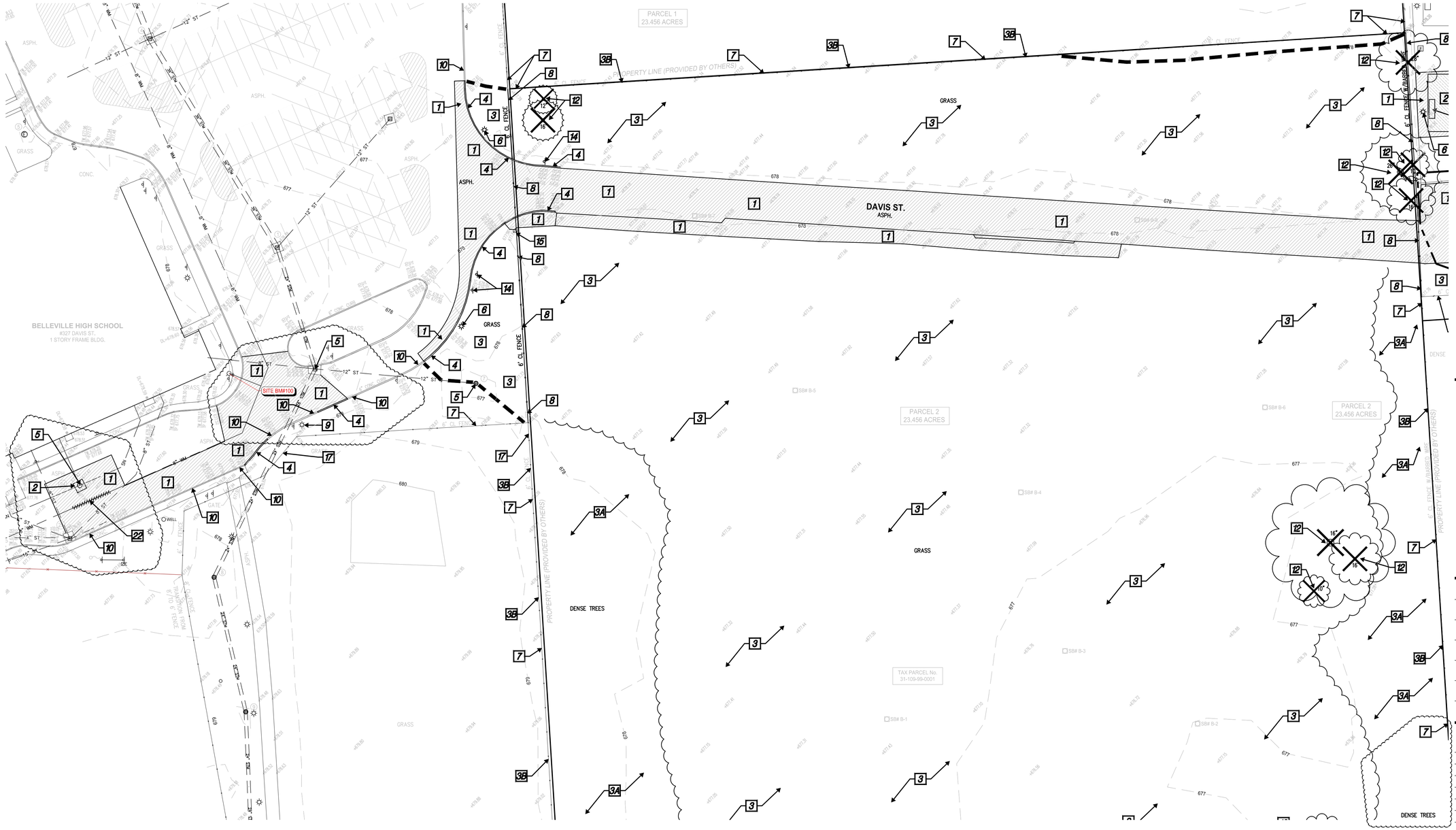
IDS Drawing Title

Demolition Plan
Area "A"

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C2.1



REFER TO SHEET C2.1 FOR DEMOLITION NOTES

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

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Approved
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Bulletin No. 1 Revised	12-08-2020

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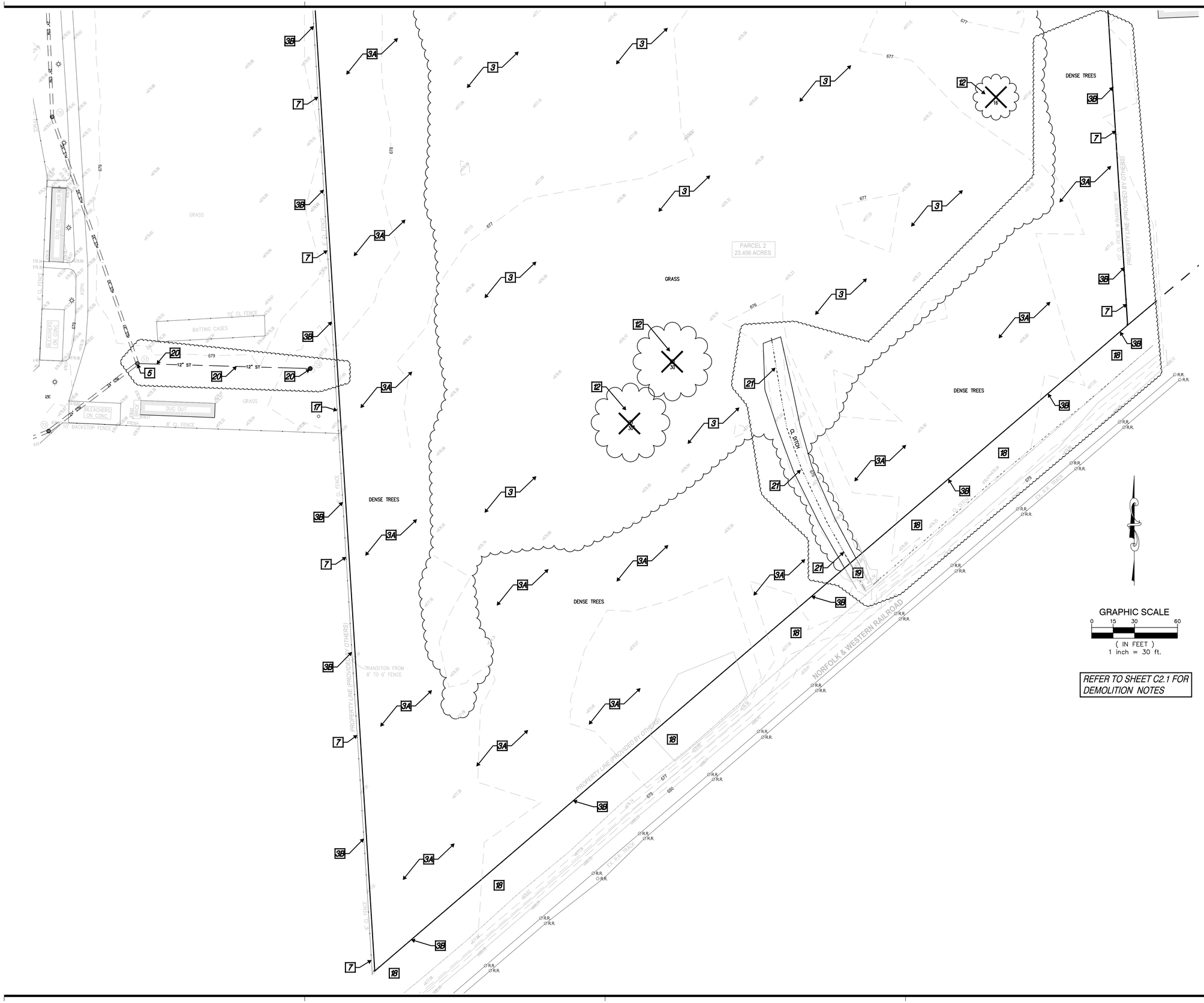
IDS Drawing Title

Demolition Plan
Area "B"

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C2.2



REFER TO SHEET C2.1 FOR DEMOLITION NOTES

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Bulletin No. 1 Revised	12-08-2020

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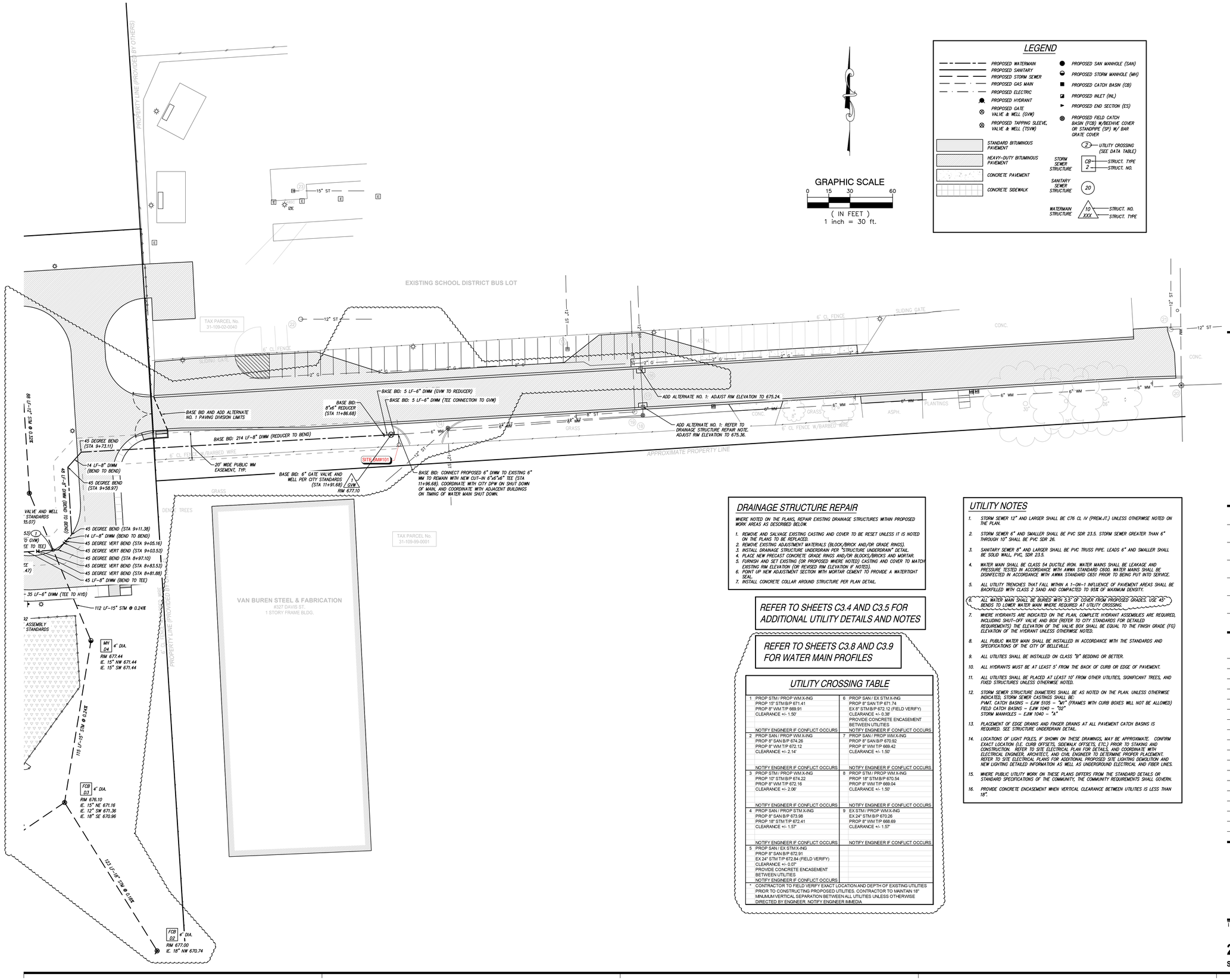
IDS Drawing Title

Demolition Plan
Area "C"

IDS Project Number: 20111-1000
SDA Project No. NP20062

Drawing Number: C2.3



DRAINAGE STRUCTURE REPAIR

WHERE NOTED ON THE PLANS, REPAIR EXISTING DRAINAGE STRUCTURES WITHIN PROPOSED WORK AREAS AS DESCRIBED BELOW.

1. REMOVE AND SALVAGE EXISTING CASTING AND COVER TO BE RESET UNLESS IT IS NOTED ON THE PLANS TO BE REPLACED.
2. REMOVE EXISTING ADJUSTMENT MATERIALS (BLOCK/BRICK AND/OR GRADE RINGS).
3. INSTALL DRAINAGE STRUCTURE UNDERDRAIN PER "STRUCTURE UNDERDRAIN" DETAIL.
4. PLACE NEW PRECAST CONCRETE GRADE RINGS AND/OR BLOCKS/BRICKS AND MORTAR.
5. FURNISH AND SET EXISTING (OR PROPOSED WHERE NOTED) CASTING AND COVER TO MATCH EXISTING RIM ELEVATION (OR REVISED RIM ELEVATION IF NOTED).
6. POINT UP NEW ADJUSTMENT SECTION WITH MORTAR CEMENT TO PROVIDE A WATERTIGHT SEAL.
7. INSTALL CONCRETE COLLAR AROUND STRUCTURE PER PLAN DETAIL.

REFER TO SHEETS C3.4 AND C3.5 FOR ADDITIONAL UTILITY DETAILS AND NOTES

REFER TO SHEETS C3.8 AND C3.9 FOR WATER MAIN PROFILES

UTILITY CROSSING TABLE

1	PROP STM / PROP WM X-ING PROP 15" STM B/P 671.41 PROP 8" WM T/P 669.91 CLEARANCE +/- 1.50' NOTIFY ENGINEER IF CONFLICT OCCURS	6	PROP SAN / EX STM X-ING PROP 8" SAN T/P 671.74 EX 8" STM B/P 672.12 (FIELD VERIFY) CLEARANCE +/- 0.38' PROVIDE CONCRETE ENCASEMENT BETWEEN UTILITIES NOTIFY ENGINEER IF CONFLICT OCCURS
2	PROP SAN / PROP WM X-ING PROP 8" SAN B/P 674.26 PROP 8" WM T/P 672.12 CLEARANCE +/- 2.14' NOTIFY ENGINEER IF CONFLICT OCCURS	7	PROP SAN / PROP WM X-ING PROP 8" SAN B/P 670.92 PROP 8" WM T/P 669.42 CLEARANCE +/- 1.50' NOTIFY ENGINEER IF CONFLICT OCCURS
3	PROP STM / PROP WM X-ING PROP 10" STM B/P 674.22 PROP 8" WM T/P 672.16 CLEARANCE +/- 2.06' NOTIFY ENGINEER IF CONFLICT OCCURS	8	PROP STM / PROP WM X-ING PROP 18" STM B/P 670.54 PROP 8" WM T/P 669.04 CLEARANCE +/- 1.50' NOTIFY ENGINEER IF CONFLICT OCCURS
4	PROP SAN / PROP STM X-ING PROP 8" SAN B/P 673.98 PROP 18" STM T/P 672.41 CLEARANCE +/- 1.57' NOTIFY ENGINEER IF CONFLICT OCCURS	9	EX STM / PROP WM X-ING EX 24" STM B/P 670.26 PROP 8" WM T/P 668.69 CLEARANCE +/- 1.57' NOTIFY ENGINEER IF CONFLICT OCCURS
5	PROP SAN / EX STM X-ING PROP 8" SAN B/P 672.91 EX 24" STM T/P 672.84 (FIELD VERIFY) CLEARANCE +/- 0.07' PROVIDE CONCRETE ENCASEMENT BETWEEN UTILITIES NOTIFY ENGINEER IF CONFLICT OCCURS		
*	CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTING PROPOSED UTILITIES. CONTRACTOR TO MAINTAIN 18" MINIMUM VERTICAL SEPARATION BETWEEN ALL UTILITIES UNLESS OTHERWISE DIRECTED BY ENGINEER. NOTIFY ENGINEER IMMEDIATELY.		

UTILITY NOTES

1. STORM SEWER 12" AND LARGER SHALL BE C76 CL IV (PREM.PT.) UNLESS OTHERWISE NOTED ON THE PLAN.
2. STORM SEWER 6" AND SMALLER SHALL BE PVC SDR 23.5. STORM SEWER GREATER THAN 6" THROUGH 10" SHALL BE PVC SDR 26.
3. SANITARY SEWER 8" AND LARGER SHALL BE PVC TRUSS PIPE. LEADS 6" AND SMALLER SHALL BE SOLID WALL, PVC, SDR 23.5.
4. WATER MAIN SHALL BE CLASS 54 DUCTILE IRON. WATER MAINS SHALL BE LEAKAGE AND PRESSURE TESTED IN ACCORDANCE WITH AWWA STANDARD C600. WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C651 PRIOR TO BEING PUT INTO SERVICE.
5. ALL UTILITY TRENCHES THAT FALL WITHIN A 1-ON-1 INFLUENCE OF PAVEMENT AREAS SHALL BE BACKFILLED WITH CLASS 2 SAND AND COMPACTED TO 95% OF MAXIMUM DENSITY.
6. ALL WATER MAIN SHALL BE BURIED WITH 5.5' OF COVER FROM PROPOSED GRADES. USE 45° BENDS TO LOWER WATER MAIN WHERE REQUIRED AT UTILITY CROSSING.
7. WHERE HYDRANTS ARE INDICATED ON THE PLAN, COMPLETE HYDRANT ASSEMBLIES ARE REQUIRED, INCLUDING SHUT-OFF VALVE AND BOX (REFER TO CITY STANDARDS FOR DETAILED REQUIREMENTS) THE ELEVATION OF THE VALVE BOX SHALL BE EQUAL TO THE FINISH GRADE (FG) ELEVATION OF THE HYDRANT UNLESS OTHERWISE NOTED.
8. ALL PUBLIC WATER MAIN SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF BELLEVILLE.
9. ALL UTILITIES SHALL BE INSTALLED ON CLASS "B" BEDDING OR BETTER.
10. ALL HYDRANTS MUST BE AT LEAST 5' FROM THE BACK OF CURB OR EDGE OF PAVEMENT.
11. ALL UTILITIES SHALL BE PLACED AT LEAST 10' FROM OTHER UTILITIES, SIGNIFICANT TREES, AND FIXED STRUCTURES UNLESS OTHERWISE NOTED.
12. STORM SEWER STRUCTURE DIAMETERS SHALL BE AS NOTED ON THE PLAN. UNLESS OTHERWISE INDICATED, STORM SEWER CASTINGS SHALL BE:
    PVMT. CATCH BASINS – EJIW 5105 – "M1" (FRAMES WITH CURB BOXES WILL NOT BE ALLOWED)
    FIELD CATCH BASINS – EJIW 1040 – "02"
    STORM MANHOLES – EJIW 1040 – "A"
13. PLACEMENT OF EDGE DRAINS AND FINGER DRAINS AT ALL PAVEMENT CATCH BASINS IS REQUIRED. SEE STRUCTURE UNDERDRAIN DETAIL.
14. LOCATIONS OF LIGHT POLES, IF SHOWN ON THESE DRAWINGS, MAY BE APPROXIMATE. CONFIRM EXACT LOCATION (I.E. CURB OFFSETS, SIDEWALK OFFSETS, ETC.) PRIOR TO STAKING AND CONSTRUCTION. REFER TO SITE ELECTRICAL PLAN FOR DETAILS, AND COORDINATE WITH ELECTRICAL ENGINEER, ARCHITECT, AND CIVIL ENGINEER TO DETERMINE PROPER PLACEMENT. REFER TO SITE ELECTRICAL PLANS FOR ADDITIONAL PROPOSED SITE LIGHTING DEMOLITION AND NEW LIGHTING DETAILED INFORMATION AS WELL AS UNDERGROUND ELECTRICAL AND FIBER LINES.
15. WHERE PUBLIC UTILITY WORK ON THESE PLANS DIFFERS FROM THE STANDARD DETAILS OR STANDARD SPECIFICATIONS OF THE COMMUNITY, THE COMMUNITY REQUIREMENTS SHALL GOVERN.
16. PROVIDE CONCRETE ENCASEMENT WHEN VERTICAL CLEARANCE BETWEEN UTILITIES IS LESS THAN 18".

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Project Title

Van Buren Public Schools

The Early Childhood Development Center

Davis St.
Belleville, MI 48111

Project Administrator	V. Grant
Project Designer	J. Ensley
Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
Q.M. Review	T. Sovel
Approved	T. Sovel
Drawing Scale	As Noted

Issued for	Issue Date
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City Engineering Revisions	12-07-2020
EGLE Water Supply Permit	12-07-2020
Bulletin No. 1 Revised	12-08-2020

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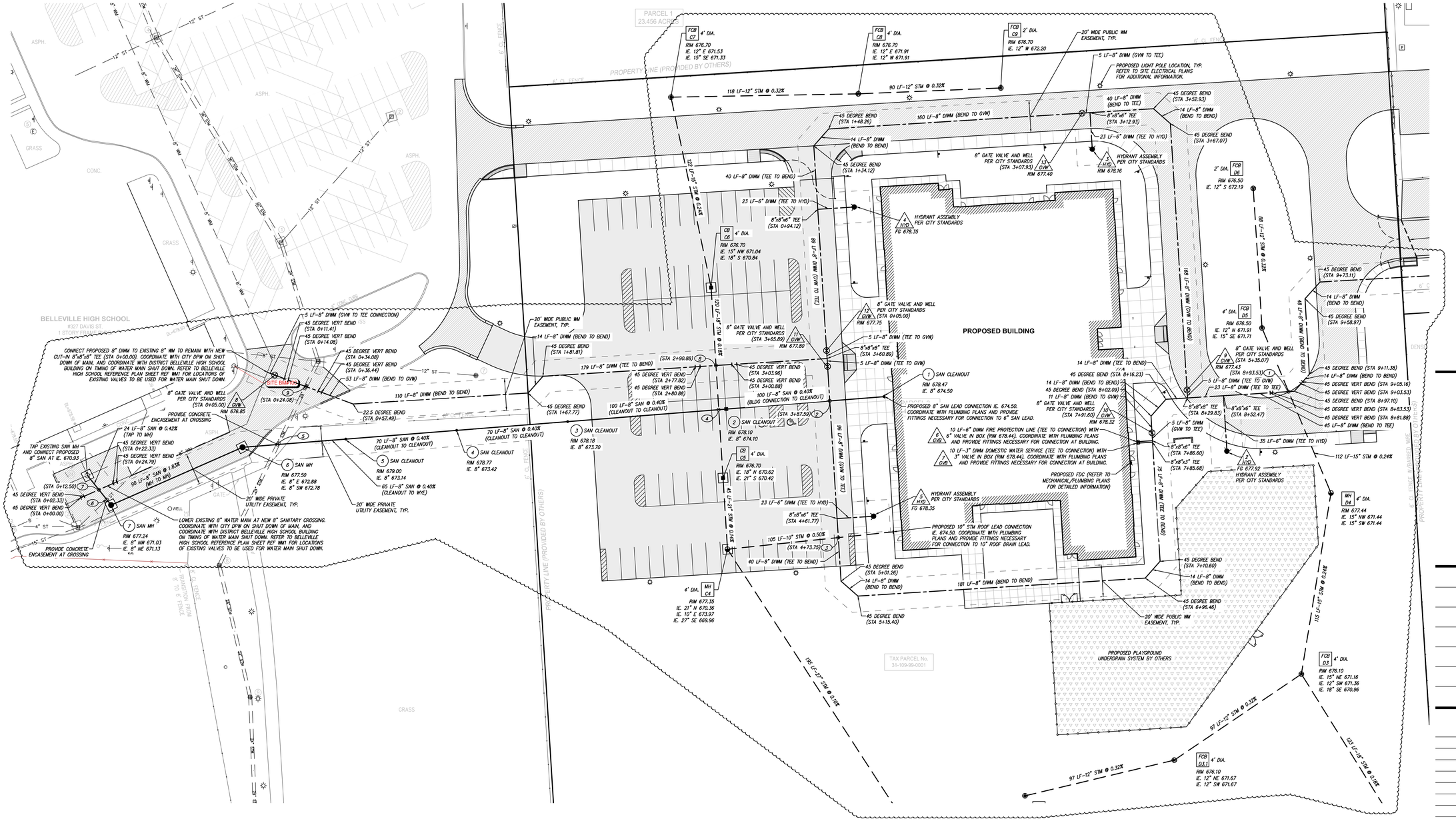
IDS Drawing Title

Utility Plan
Area "A"

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C3.1



REFER TO SHEETS C3.1, C3.4 AND C3.5 FOR UTILITY DETAILS AND NOTES

REFER TO SHEETS C3.8 AND C3.9 FOR WATER MAIN PROFILES

REFER TO SHEETS C3.10 FOR SANITARY SEWER PROFILES

GRAPHIC SCALE

0 15 30 60

(IN FEET)

1 inch = 30 ft.

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- STANDARD BITUMINOUS PAVEMENT
- HEAVY–DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- 2 — UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 / XXX — STRUCT. NO. / STRUCT. TYPE

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Bulletin No. 1 Revised	12-08-2020

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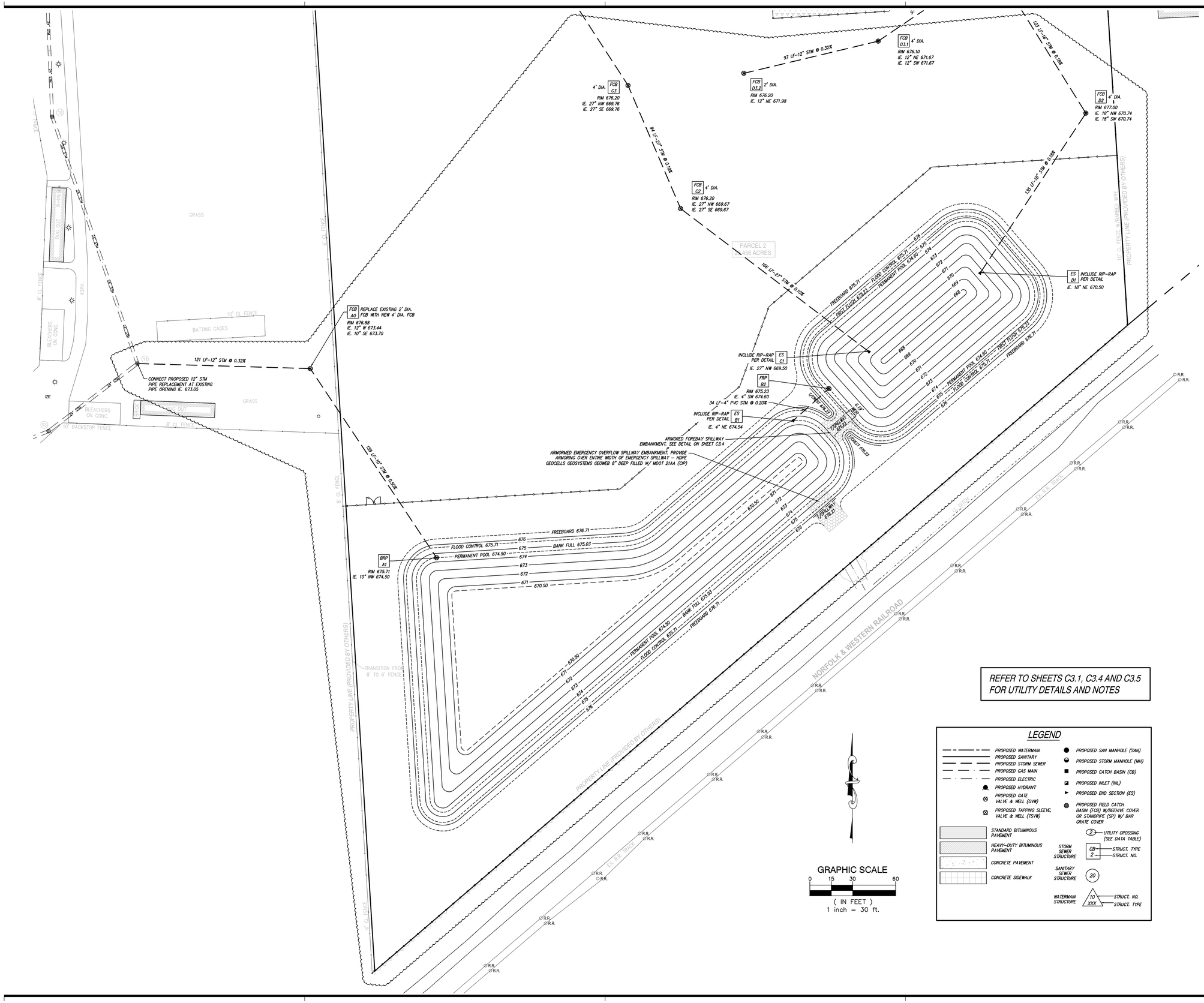
IDS Drawing Title

Utility Plan
Area "B"

IDS Project Number: 20111-1000

SDA Project No. NP20062

Drawing Number: C3.2



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Bulletin No. 1 Revised	12-08-2020

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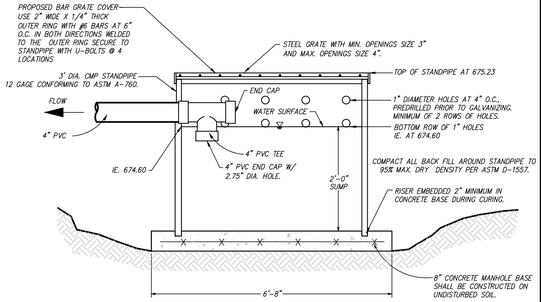
IDS Drawing Title

Utility Plan
Area "C"

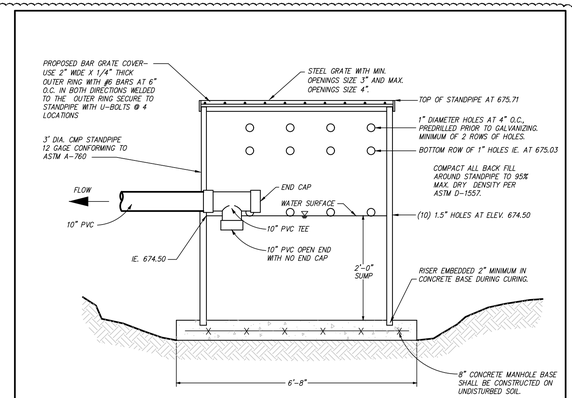
IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C3.3



FOREBAY RISER "B2" DETAIL

NO SCALE



BASIN RISER "A1" DETAIL

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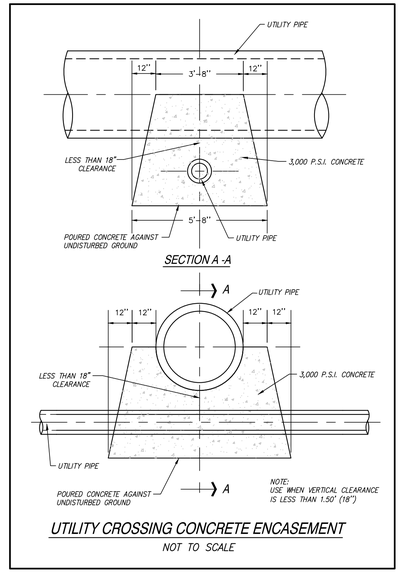
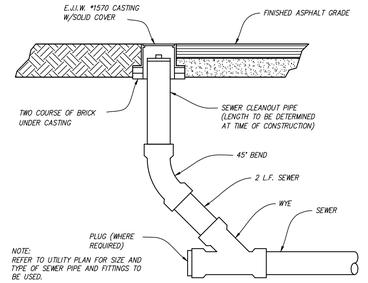


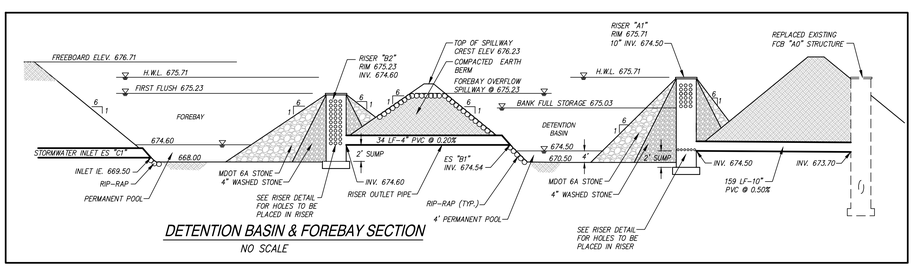
UTILITY CROSSING CONCRETE ENCASEMENT

NOT TO SCALE



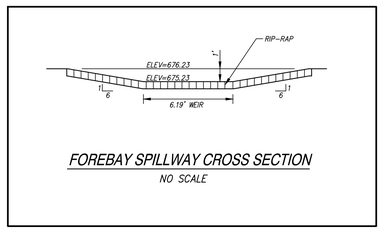
SANITARY SEWER 6" CLEANOUT DETAIL

NO SCALE



DETENTION BASIN & FOREBAY SECTION

NO SCALE



FOREBAY SPILLWAY CROSS SECTION

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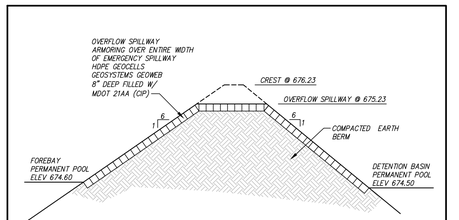
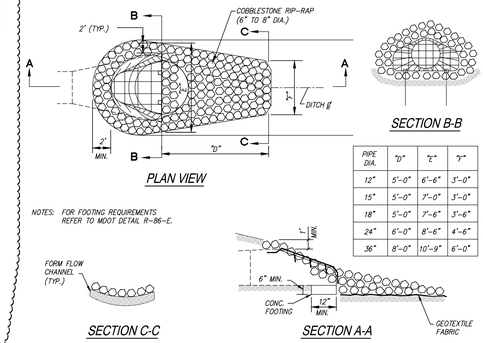


FOREBAY SPILLWAY ARMORING DETAIL

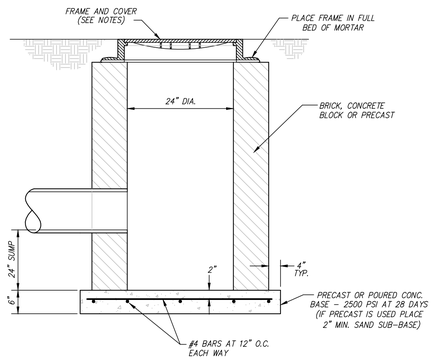
NO SCALE



PIPE DIA.	"D"	"E"	"F"
12"	5'-0"	6'-6"	3'-0"
15"	5'-0"	7'-0"	3'-0"
18"	5'-0"	7'-6"	3'-6"
24"	6'-0"	8'-6"	4'-6"
36"	8'-0"	10'-9"	6'-0"

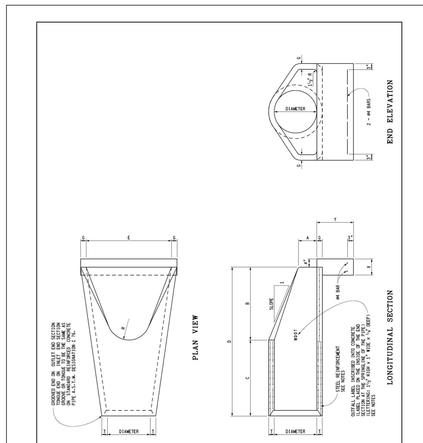
END SECTION RIP-RAP

NOT TO SCALE



2' DIAMETER STORM CATCH BASIN DETAIL

NO SCALE



MDOT

PREPARED BY DESIGN DIVISION

DRAWN BY: R.L.C.

CHECKED BY: R.L.C.

DEPARTMENT DIRECTOR Kirk T. Steudle

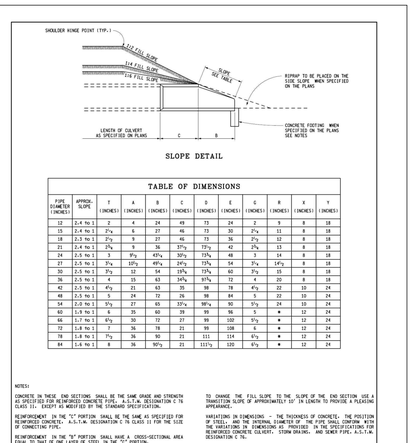
APPROVED BY: Richard W. Corbett, DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: Michael A. VanPutten, DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

PRECAST CONCRETE END SECTION FOR PIPE CULVERT

1-27-2015 F.H.W.A. APPROVAL	10-22-2014 PLAN DATE	R-86-E	SHEET 1 OF 2



SLOPE DETAIL

TABLE OF DIMENSIONS

PIPE DIAMETER (INCHES)	APPROX. SLOPE	T (INCHES)	A (INCHES)	B (INCHES)	C (INCHES)	D (INCHES)	E (INCHES)	G (INCHES)	R (INCHES)	X (INCHES)	Y (INCHES)
12	2:1 No 3	2	4	24	49	73	24	2	9	8	18
15	2:1 No 3	2¼	6	27	46	73	30	2¼	11	8	18
18	2:1 No 3	2½	9	27	46	73	36	2½	13	8	18
21	2:1 No 3	2¾	9	36	37½	73½	42	2¾	13	8	18
24	2:1 No 3	3	9½	43¼	30½	73⅞	48	3	14	8	18
27	2:1 No 3	3¼	10½	49¼	24½	73⅞	54	3¼	14½	8	18
30	2:1 No 3	3½	12	54	19⅝	73⅞	60	3½	15	8	18
36	2:1 No 3	4	15	63	347⁄8	91⅞	72	4	20	8	18
42	2:1 No 3	4½	21	63	35	98	78	4½	22	10	24
48	2:1 No 3	5	24	72	26	98	84	5	22	10	24
54	2:1 No 3	5½	27	45	33¼	98¼	90	5½	24	10	24
60	1:1 No 3	6	35	60	39	99	96	5	★	12	24
66	1:1 No 3	6½	30	72	27	99	102	5½	★	12	24
72	1:1 No 3	7	36	78	21	99	108	6	★	12	24
78	1:1 No 3	7½	36	90	21	111	114	6½	★	12	24
84	1:1 No 3	8	36	90½	21	111½	120	6½	★	12	24

NOTES:

CONCRETE IN THESE END SECTIONS SHALL BE THE SAME GRADE AND STRENGTH AS SPECIFIED FOR REINFORCED CONCRETE PIPE, A.S.T.M. DESIGNATION C 76 CLASS II., EXCEPT AS MODIFIED BY THE STANDARD SPECIFICATION.

REINFORCEMENT IN THE "C" PORTION SHALL BE THE SAME AS SPECIFIED FOR REINFORCED CONCRETE, A.S.T.M. DESIGNATION C 76 CLASS III FOR THE SIZE OF CONNECTING PIPE.

REINFORCEMENT IN THE "B" PORTION SHALL HAVE A CROSS-SECTIONAL AREA EQUAL TO THAT OF ONE LAYER OF STEEL IN THE "C" PORTION.

THE END OF THE PIPE CULVERT SHALL BE PLACED IN THE CONCRETE END SECTION SO THAT THE FLOW LINES ARE FLUSH. THE JOINT SHALL BE COMPLETELY FILLED WITH MORTAR.

TO CHANGE THE FILL SLOPE TO THE TOE, SLOPE OF THE END SECTION USE A TRANSITION SLOPE OF APPROXIMATELY 50' IN LENGTH TO PROVIDE A PLEASING APPEARANCE.

VARIATIONS IN DIMENSIONS - THE THICKNESS OF CONCRETE, THE POSITION OF STEEL, AND THE INTERNAL DIAMETER OF THE PIPE SHALL CONFORM WITH THE VARIATIONS IN DIMENSIONS AS PROVIDED IN THE SPECIFICATIONS FOR REINFORCED CONCRETE CULVERT, STORM DRAINS, AND SEWER PIPE, A.S.T.M. DESIGNATION C 76.

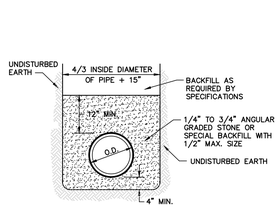
PLACE CONCRETE FOOTING WHEN CULVERT GRADE IS 4% OR MORE, OR WHEN SPECIFIED ON THE ROAD PLANS.

OUTFALL LABEL TO BE USED ONLY WHERE STORMWATER WILL DISCHARGE DIRECTLY TO THE WATERS OF THE STATE.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

PRECAST CONCRETE END SECTION FOR PIPE CULVERT

1-27-2015 F.H.W.A. APPROVAL	10-22-2014 PLAN DATE	R-86-E	SHEET 2 OF 2



STANDARD BEDDING

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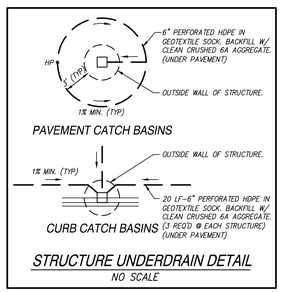
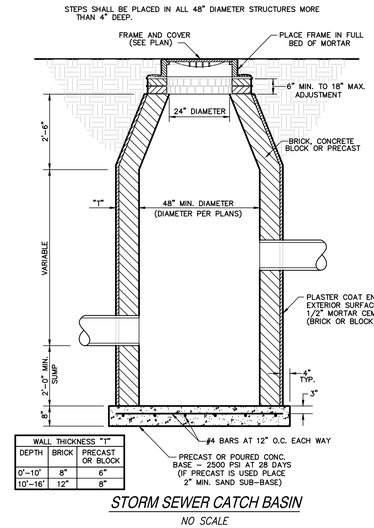


STRUCTURE UNDERDRAIN DETAIL

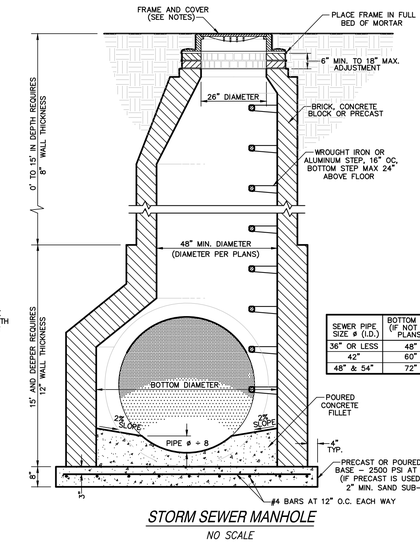
NO SCALE



WALL THICKNESS "T"		
DEPTH	BRICK	PRECAST OR BLOCK
0'-10'	8"	6"
10'-16'	12"	8"

STORM SEWER CATCH BASIN

NO SCALE



SEWER PIPE SIZE ø (I.D.)	BOTTOM DIA. (IF NOT ON PLANS)
36" OR LESS	48"
42"	60"
48" & 54"	72"

STORM SEWER MANHOLE

NO SCALE

iDS

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IDS Drawing Title

Utility Details and Notes

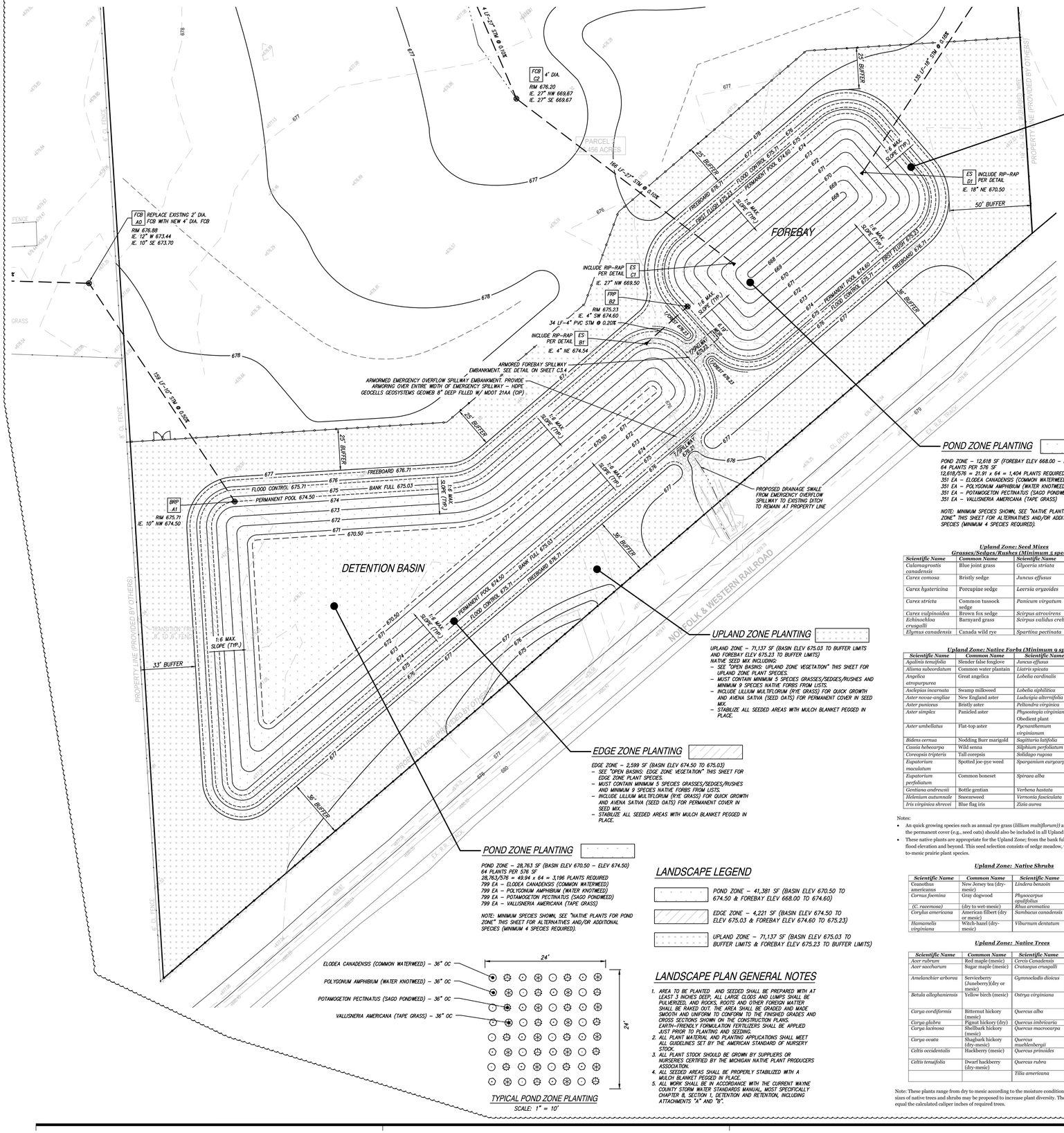
IDS Project Number

20111-1000

SDA Project No. NP20062

Drawing Number

C3.4



OPEN DETENTION BASINS: EDGE ZONE VEGETATION

A variety of trees, shrubs, wildflowers, and grasses may be planted in the edge zone along the banks of detention basins. A native wetland edge or native sedge meadow seed mix is recommended.

Edge Zone: Native Seed Mixes

Grasses/Sedges/Rushes (Minimum 5 species)

Scientific Name	Common Name	Scientific Name	Common Name
Carex 'lurida	Bottlebrush sedge	*Juncus effuses*	Common rush
Carex vulpinoidea	Brown fox sedge	*Leersia oryzoides*	Rice cut grass
Echinochloa crusgalli	Barnyard grass	*Scirpus acutus*	Hard-stemmed bulrush
Elymus Canadensis	Canada wild rye	*Scirpus atrovirens*	Dark green rush
Glyceria striata	Fowl manna grass	*Scirpus pungens*	Chairmaker's rush
		Scirpus validus creber	Great bulrush (softstem)

Native Forbs (Minimum 9 species)

Scientific Name	Common Name	Scientific Name	Common Name
Acorus calamus	Sweet flag		
Actinomeris alternifolia	Wingstem	*Mimulus ringens*	Monkey flower
Alisma subcordatum	Common water plantain	*Peltandra virginica*	Arrow arrum
Asclepias incarnate	Swamp milkweed	*Polygonum pensylvanicum*	Pinkweed
Aster simplex	Panicled aster	*Pontederia cordata*	Pickerel weed
Bidens spp.	Bidens, various	*Rosa palustris*	Swamp rose
Cassia hebecarpa	Wild senna	*Rudbeckia laciniata*	Wild golden glow
Eupatorium perfoliatum	Common boneset	*Sagittaria latifolia*	Common arrowhead
Helenium autumnale	Sneezeweed	*Spiraea alba*	Meadowsweet
Iris virginica shrevei	Blue flag iris	*Verbena hastata*	Blue vervain
Ludwigia alternifolia	Seedbox	*Vernonia fasciculata*	Common ironweed

Note: A quick growing species such as annual rye grass (*lillium multiflorum*)) and species which will provide the permanent cover (e.g., seed oats) should also be included in all Edge Zone seed mixes.

Edge Zone: Native Shrubs

Scientific Name	Common Name	Scientific Name	Common Name
Alnus rugosa	Speckled alder	*Ilex verticillata*	Winterberry (MI Holly)
Aronia melanocarpa	Black chokeberry	*Potentilla fruticosa*	Shrubby cinquefoil
Betula pumila	Bog birch	*Sambucus Canadensis*	Elderberry
Cephalanthus occidentalis	Buttonbush (plant in min. 6" water)	*Spiraea alba*	Meadowsweet
Cornus amomum	Silky dogwood	*Viburnum lentago*	Nannyberry
Cornus stolonifera	Red-osier dogwood	*Viburnum trilobum*	American highbush cranberry

Edge Zone: Native Trees

Scientific Name	Common Name	Scientific Name	Common Name
Acer saccharinum	Silver maple	*Quercus bicolor*	Swamp white oak
Betula nigra	River birch	*Liquidambar styraciflua*	Sweetgum
Carpinus caroliniana	American hornbeam	*Liriodendron tulipifera*	Tuliptree
Nyssa sylvatica	Black gum	*Quercus palustris*	Pin oak
Platanus occidentalis	Sycamore	Salix nigra	Black willow

Upland Zone: Seed Mixes

Grasses/Sedges/Rushes (Minimum 5 species)

Scientific Name	Common Name	Scientific Name	Common Name
Calamagrostis canadensis	Blue joint grass	*Glyceria striata*	Fowl manna grass
Carex comosa	Bristly sedge	*Juncus effusus*	Common rush
Carex hystericina	Porcupine sedge	*Leersia oryzoides*	Rice cut grass
Carex stricta	Common tussock sedge	*Panicum virgatum*	Switch grass
Carex vulpinoidea	Brown fox sedge	*Scirpus atrovirens*	Dark green rush
Echinochloa crusgalli	Barnyard grass	*Scirpus validus creber*	Great bulrush
Elymus canadensis	Canada wild rye	*Spartina pectinata*	Prairie cord grass

Upland Zone: Native Forbs (Minimum 9 species)

Scientific Name	Common Name	Scientific Name	Common Name
Agalinis tenuifolia	Slender false foxglove	*Juncus effusus*	Common rush
Alisma subcordatum	Common water plantain	*Liatris spicata*	Marsh blazing star
Angelica atropurpurea	Great angelica	*Lobelia cardinalis*	Cardinal flower
Asclepias incarnata	Swamp milkweed	*Lobelia siphilitica*	Great blue lobelia
Aster novae-angliae	New England aster	*Ludwigia alternifolia*	Seedbox
Aster puniceus	Bristly aster	*Peltandra virginica*	Arrow arrum
Aster simplex	Panicled aster	*Physostegia virginiana*	Obedient plant
Aster umbellatus	Flat-top aster	*Pycnanthemum virginianum*	Common mountain mint
Bidens cernua	Nodding Burr marigold	*Sagittaria latifolia*	Common arrowhead
Cassia hebecarpa	Wild senna	*Silphium perfoliatum*	Cup plant
Coreopsis tripteris	Tall corepais	*Solidago rugosa*	Rough goldenrod
Eupatorium maculatum	Spotted joe-pye weed	*Sparganium eurycarpum*	Common bur reed
Eupatorium perfoliatum	Common boneset	*Spiraea alba*	Meadowsweet
Gentiana andrewsii	Bottle gentian	*Verbena hastata*	Blue vervain
Helenium autumnale	Sneezeweed	*Vernonia fasciculata*	Common ironweed
Iris virginica shrevei	Blue flag iris	*Zizia aurea*	Golden alexanders

Notes:

- An quick growing species such as annual rye grass (*lillium multiflorum)*) and species which will provide the permanent cover (e.g., seed oats) should also be included in all Upland Zone seed mixes.
- These native plants are appropriate for the Upland Zone; from the bank full elevation to the 100-year flood elevation and beyond. This seed selection consists of sedge meadow, wet-to-mesic prairie, and dry-to-mesic prairie plant species.

Upland Zone: Native Shrubs

Scientific Name	Common Name	Scientific Name	Common Name
Ceanothus americanus	New Jersey tea (dry-mesic)	*Linderа benzoin*	Spicebush (mesic)
Cornus foemina	Gray dogwood	*Physocarpus opulifolius*	Ninebark (dry or mesic)
(C. racemosa)	(dry to wet-mesic)	*Rhus aromatica*	Fragrant sumac (dry)
Corylus americana	American filbert (dry or mesic)	*Sambucus canadensis*	Elderberry (wet-mesic)
Hamamelis virginiana	Witch-hazel (dry-mesic)	*Viburnum dentatum*	Arrowwood (dry-mesic)

Upland Zone: Native Trees

Scientific Name	Common Name	Scientific Name	Common Name
Acer rubrum	Red maple (mesic)	*Cercis Canadensis*	Redbud (mesic)
Acer saccharum	Sugar maple (mesic)	*Crataegus crusgalli*	Cockspur hawthorn (dry)
Amelanchier arborea	Serviceberry (Juneberry)(dry or mesic)	*Gymnocladis dioicus*	Kentucky coffeetree (mesic)
Betula alleghaniensis	Yellow birch (mesic)	*Ostrya virginiana*	Hip-hornbeam Ironwood (dry-mesic)
Carya cordiformis	Bitternut hickory (mesic)	*Quercus alba*	White oak (mesic)
Carya glabra	Pignut hickory (dry)	*Quercus imbricaria*	Shingle oak (mesic)
Carya lacinosa	Shellbark hickory (mesic)	*Quercus macrocarpa*	Bur oak (dry or mesic)
Carya ovata	Shagbark hickory (dry-mesic)	*Quercus muehlenbergii*	Chinkapin oak (dry or mesic)
Celtis occidentalis	Hackberry (mesic)	*Quercus prinoides*	Dwarf chinkapin oak (dry)
Celtis tenuifolia	Dwarf hackberry (dry-mesic)	*Quercus rubra*	Red Oak (mesic)
		Tilia americana	American basswood (mesic)

Note: These plants range from dry to mesic according to the moisture conditions in the Upland Zone. Small sizes of native trees and shrubs may be proposed to increase plant diversity. The total tree caliper inches must equal the calculated caliper inches of required trees.

Native Plants for Pond Zone (minimum 4 species)

Scientific Name	Common Name	Spacing (inches on center)	Scientific Name	Common Name	Spacing (inches on center)
Acorus calamus	Sweet flag	24	*Polygonum amphibium*	Water knotweed	36
Carex lacustris	Common lake sedge	24	*Pontederia cordata*	Pickerel weed	24
Cephalanthus occidentalis	Buttonbush	5 feet	*Potamogeton natans*	Common pondweed	36
Decodon verticillatus	Swamp Loosestrife	24	*Potamogeton pectinatus*	Sago pondweed	36
Elodea canadensis	Common waterweed	36	*Sagittaria latifolia*	Common arrowhead	24
Hibiscus laevis	Halberd-leaved rose mallow	24	*Scirpus acutus*	Hard-stemmed bulrush	18
Hibiscus palustris	Swamp rose mallow	24	*Scirpus atrovirens*	Dark green rush	18
Iris virginica shrevei	Blue flag iris	18	*Scirpus cyperinus*	Wool grass	24
Justicia americana	Water willow	5 feet	*Scirpus fluviatilis*	River bulrush	18
Nelumbo lutea	Lotus	48	*Scirpus validus creber*	Great bulrush	18
Nuphar advena	Yellow pond lily	36	*Sparganium americanum*	American bur reed	18
Nymphaea tuberosa	White water lily	36	*Sparganium eurycarpum*	Common bur reed	18
Peltandra virginica	Arrow arum	18	*Vallisneria Americana*	Tape grass	36

Note: Plant species selected should cover 25% of the pond zone and should also cover the range of water depths within the pond zone (0 ft to 3 ft). (For example, 4 plant species may not all be placed at an 18-inch water depth covering 25% of the pond zone.)

DETENTION BASIN LANDSCAPE MAINTENANCE PLAN

- Inspect and clean the storm sewer system and catch basins upstream from the detention basin (every five years or as needed).
- Inspect for sediment accumulation at the inlet pipes and remove sediment which may be impeding flow (semiannually and after rain events).
- Inspect inlets, outlets, and appurtenances (e.g., grates) annually for structural integrity.
- Check the outlets regularly for clogging and clean when necessary, especially after large storm events.
- Inspect the stone around riser-type outlet structures semiannually and after rain events. If stone has accumulated sediment, vegetation and/or debris to an extent that water is not flowing through the stone and out of the pond as originally designed, then the stone should be replaced.
- Check for floatables and debris and remove as necessary.
- Remove dead vegetation that obstructs flow (early spring).
- Check banks and bottom for erosion, and regrade or reshape as necessary (annually).
- Remove sediment when accumulation reaches 6 – 12 inches or if resuspension is observed.
- Reseed banks near inlet/outlet and stabilize eroded banks as necessary.
- Inspect detention basin and buffer strip zone for invasive species such as purple loosestrife, phragmites, buckthorn (common & glossy), honeysuckle and autumn olive that out-compete native vegetation (annually - July).
- Have a professional selectively remove invasive species (annually, July–August). Purple loosestrife flower heads can be clipped off to reduce seed production until plant removal may be achieved. If woody debris is cut, the cut should be four inches above the ground surface and the stumps should be treated with herbicide immediately after cutting, and monitor for sucker growth. Use of chemicals within the pond (e.g., for control of algae or invasive species) requires a permit from the MDEQ.
- Plantings must be monitored for two years after establishment. Replacement will be necessary as determined by the agency having jurisdiction over the system.
- During the first two growing seasons, all areas planted with native prairie seed mix should be mowed three times at a height of 6-8 inches in order to control weeds. Beginning in the third year, a burning or mowing regimen should be instituted, either burning or mowing once in spring, or once in the fall.
- Except as described herein, ensure that no mowing, chemical application, or construction has occurred in the buffer strip (annually). If it has, take corrective action to ensure these activities do not occur in the future.
- Except as described herein, ensure that chemicals are not applied to any aspect of the open detention basin, including the bottom, side slopes or buffer strip.
- If the outlet is pumped, then only a licensed electrician or company that provided the pump system should conduct maintenance.

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Project Title

Van Buren Public Schools

The Early Childhood Development Center

Davis St.
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Project Administrator	V. Grant
Project Designer	J. Ensley
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Drawing Scale	As Noted

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IDS Drawing Title

Detention Basin Plan

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C3.5

Drainage Area "Pond"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	0	0.00	0.95
Water	50983	1.17	1.00
Lawn	94701	2.17	0.15
	145684	**3.34**	**0.45**

Drainage Area "C2"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	0	0.00	0.95
Water	0	0.00	1.00
Lawn	42599	0.98	0.15
	42599	**0.98**	**0.15**

Drainage Area "C3"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	0	0.00	0.95
Water	0	0.00	1.00
Lawn	68157	1.56	0.15
	68157	**1.56**	**0.15**

Drainage Area "C5"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	18236	0.42	0.95
Water	0	0.00	1.00
Lawn	26381	0.61	0.15
	44617	**1.02**	**0.48**

Drainage Area "C6"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	26101	0.60	0.95
Water	0	0.00	1.00
Lawn	8552	0.20	0.15
	34653	**0.80**	**0.75**

Drainage Area "C7"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	5010	0.12	0.95
Water	0	0.00	1.00
Lawn	3993	0.09	0.15
	9003	**0.21**	**0.60**

Drainage Area "C8"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	3587	0.08	0.95
Water	0	0.00	1.00
Lawn	3242	0.07	0.15
	6829	**0.16**	**0.57**

Drainage Area "C9"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	5192	0.12	0.95
Water	0	0.00	1.00
Lawn	6765	0.16	0.15
	11957	**0.27**	**0.50**

Drainage Area "Roof"

Type of Surface	Size (sft)	Size (acres)	C
Roof	30868	0.71	0.95
Pavement	0	0.00	0.95
Water	0	0.00	1.00
Lawn	0	0.00	0.15
	30868	**0.71**	**0.95**

Drainage Area "D2"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	0	0.00	0.95
Water	0	0.00	1.00
Lawn	4291	0.10	0.15
	4291	**0.10**	**0.15**

Drainage Area "D3"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	446	0.01	0.95
Water	0	0.00	1.00
Lawn	31982	0.73	0.15
	32428	**0.74**	**0.16**

Drainage Area "D3.1"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	613	0.01	0.95
Water	0	0.00	1.00
Lawn	18939	0.43	0.15
	19552	**0.45**	**0.18**

Drainage Area "D3.2"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	1836	0.04	0.95
Water	0	0.00	1.00
Lawn	17282	0.40	0.15
	19118	**0.44**	**0.23**

Drainage Area "D5"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	11675	0.27	0.95
Water	0	0.00	1.00
Lawn	9662	0.22	0.15
	21337	**0.49**	**0.59**

Drainage Area "D6"

Type of Surface	Size (sft)	Size (acres)	C
Roof	0	0.00	0.95
Pavement	10634	0.24	0.95
Water	0	0.00	1.00
Lawn	12150	0.28	0.15
	22784	**0.52**	**0.52**

GRAPHIC SCALE

0 25 50 100

(IN FEET)

1 inch = 50 ft.

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IDS Drawing Title

Storm Sewer Drainage Map

IDS Project Number

20111-1000

SDA Project No. NP20062

Drawing Number

C3.6

Detention Basin Design for 100-Year Design Storm

(Based on Wayne County Storm Water Management Standards, version 2.0)

Area Label	A (Ac.)	C	A*C
Roofs	0.71	0.95	0.67
Pavements	1.91	0.95	1.81
Water	1.17	1.00	1.17
Lawn (Soil Group A, <4%)	8.00	0.15	1.20
Sum	11.79		4.86
Compound Run-off Coefficient, C :			**0.41**

FOREBAY & FIRST FLUSH VOLUME & ORIFICE CALCULATIONS

Determine the forebay volume required to store the first flush of runoff from the site.

Required volume to capture the first flush, VtFF:

VtFF = 1815 x A x C = 1815 x 11.79 x 0.41 = 8774 CFT

Refer to Basin capacity calculations for incremental and cumulative storage volumes determining the total storage volume provided in the forebay and the water surface elevation corresponding to the first flush storage volume.

To gradually release the first flush storage volume over a period of 24 hours, the desired average release rate is:

QaveFF = VtFF / 86400 = 8774 / 86400 = 0.102 CFS

The riser outlet pipe and orifice restrictor will be sized to convey the desired average release rate given the average head in the forebay. Since the forebay has a trapezoidal cross section, 2/3 of the maximum head in the forebay is a reasonable approximation to the average head as follows:

h_ave = 2/3 (Zff - Zout)

where: Zout = upstream crown elevation of riser outlet pipe (ft) assuming the outlet pipe is designed to flow full at 0.102 CFS.

Use the orifice equation to determine the required riser outlet pipe diameter which will yield the desired average release rate and holding time.

d_out = assume 4 inches for calculating h_avg = 0.33 FT

Storage Provided

Determine the flood control storage volume required.

Elev. (ft)	Area Only	Basin Only	Cumulative Volume (CFT)
674.6	12,619		0
675.0	13,699	5,264	5,264
676.0	16,556	15,128	20,391

Forbay bottom elevation from table, Zbottom: **674.60**

First flush storage elevation from interpolation, Zff: **675.23**

So,

Zout = Zbottom + d_out = 674.6 + 0.33 = 674.93 FT

h_ave = 2/3 (Zff - Zout) = 2/3 (675.23 - 674.93) = 0.2 FT

Aout = QaveFF / (0.62(2 g H_ave)^0.5) =0.102/(0.62(2 x 32.2 x 0.2)^0.5) = 0.0458

Therefore, the orifice diameter will be:

Do = 2 (Aout/Pi)^0.5 = 2 (0.0458/Pi)^0.5 = 0.241 FT, or 2.9 inches

use **2.75 inches**

Since 4 inches is the minimum allowable riser outlet pipe size, a 2.75 inch diameter hole will be drilled in the end cap on the vertical run of the outlet tee. No recalculation of h_ave is needed since the selected riser outlet pipe equals the assumed diameter used in calculating h_ave.

Do = 2.75 inches = 0.229 FT

Which has an orifice area of: **Ao = 0.0412 SFT**

Dout = 4 inches = 0.333 FT

Which has an orifice area of: **Aout = 0.0871 SFT**

The actual average release rate through the orifice restrictor and outlet pipe is:

Qave_ff = 0.62 (Ao) ((2 g h_ave)^0.5)
= 0.62(0.0412)((2x32.2x0.2)^0.5)
= 0.090 CFS

Qave_ff of 0.09 CFS < desired rate of 0.102 CFS, therefore OK.

Actual holding time is:

Tff = VtFF/Qff_actual = 8774 / 0.09 / 60 min / 60 sec
= 27.1 HRS
Tff > 24 HRS, OK!

Riser Outlet Pipe Slope

Determine riser outlet pipe slope to be consistent with earlier assumption that it is flowing full at the actual average release rate. Use Manning's equation with n = 0.012 for PVC pipe.

Slope (ft/ft) = [(Qave_ff x n)/(1.486 x Aout x R^2/3)]^2

where, **R = Dout / 4 = 0.333 / 4 = 0.083 FT**

So, **Slope (ft/ft) = [(0.09 x 0.012)/(1.486 x 0.0871 x 0.083^2/3)]^2**

Slope = 0.0019 FT/FT
= 0.2 %

Therefore, use a 4 inch PVC pipe at 0.2% slope.

Check velocity at full flow condition against maximum allowable closed conduit velocity.

V = Qave_ff / Aout = 0.09 / 0.0871 = 1.03 FPS

1.03 < Vmax of 8 FPS therefore, OK.

100-YEAR DETENTION BASIN VOLUME CALCULATIONS

Since the site is larger than 5 acres, the maximum allowable outflow from this site is 0.15 cfs/acre for the 100-year storm. The detention basin will be designed with a permanent pool, but we must verify that it is below the downstream invert of the forebay riser outlet pipe.

Length of riser outlet pipe, per plan = 34 FT

Surface elevation of permanent pool, per plan = 674.50

D.S. Invert = 674.6 - (0.0019 x 34) = 674.54

674.54 > 674.5 therefore, OK.

Required Volume

Determine the flood control storage volume required.

Permissible Discharge Rate per Acre, q: **0.15 CFS/Ac**

Maximum allowable release rate from the flood control storage volume, Qa:

Qa = q x A = 0.15 x 11.79 = 1.77 CFS

Maximum outflow rate per acre imperviousness, Qo:

Qo = Qa / (A x C) = 1.77 / (11.79 x 0.41) = 0.37 CFS/acre*imperviousness

Storage time - the instant storage begins until peak storage is attained, T100:

T100 = -45 + sqrt(19,845 / Qo) = -45 + sqrt(19,845 / 0.37) = 186.59 minutes

Maximum volume of water stored in the detention basin per acre of imperviousness, Vs100:

Vs100 = [(17,649 x T100) / (T100+45)] - 40 x Qo x T100

= (17,649 x 186.59) / (186.59 + 45) - 40 x 0.37 x 186.59 = 11458 CFT/acre*imperviousness

Maximum volume of water stored in the detention basin (required), Vt100:

Vt100 = Vs10 x A x C = 11458 x 11.79 x 0.41 = 55387 CFT

Determine bank full flood storage volume, Vtbf:

VtBF = 5160 x A x C = 5160 x 11.79 x 0.41 = 24,943 CFT

Storage Provided

Determine the flood control storage volume required.

Elev. (ft)	Area (SFT) Basin Only	Area (SFT) Forebay (But only above elev. Zff)	Incremental Volumes (CFT) Basin Only	Incremental Volumes (CFT) Forebay (But only above elev. Zff)	Cumulative Volume (CFT)
674.5	28,763	0			0
675.0	31,467	0	15,058		15,058
675.23	32,674	14,308	7,376		22,434
676.0	37,044	16,556	26,841	11,883	61,158

The portion of the bank full flood to be captured in the detention basin is determined by subracting the first flush storage volume provided in the forebay.

VtBF(adj) = VtBF - VtFF = 24943 - 8774 = 16,169 CFT

Basin bottom elevation from table, Zbottom: **674.50**

Bank full flood storage elevation from interpolation, Zbf: **675.03**

The portion of the flood control storage volume to be captured in the detention basin is also determined by subracting the first flush storage volume provided in the forebay.

Vt100(adj) = Vt100 - VtFF = 55387 - 8774 = 46,613 CFT

Flood control storage elevation from interpolation, Z100: **675.71**
(Design Water Level for the Basin)

Outlet Design

Top of riser/ overflow structure to be set at the flood control storage elevation, Z100 = **675.71**

Riser outlet pipe will have an upstream invert elevation at: **674.50**

Riser Orifice Sizing

To gradually release the bank full flood storage volume over a period of 40 hours, the average release rate for the full 40 hour period is calculated as follows:

QaveBF = VtBF / 144,000 = 24943 / 144,000 = 0.17 CFS

However, since almost all of the forebay storage volume will be released at an average of 0.102 CFS during the last 27.1 of the 40 hours, the remainder of the bank full flood storage volume must be released at a rate in excess of 0.17 CFS during the first 12.9 of the 40 hours. The desired average release rate for the remainder of the bank full flood volume is:

QaveBF = (VtBF - VtFF) / [(40 - Tff) x 3600]
= (24943 - 8774) / [(40 - 27.1) x 3,600 = 0.35 CFS

A number holes will be drilled in the riser at elevation 674.5. The number and size of holes will be selected to convey the average release rate for the remainder of the bank full flood given the average head in the detention basin. Since the detention basin has a trapezoidal cross section, 2/3 of the maximum head on the orifice is a reasonable approximation for the average head on the orifice as follows:

h_ave_us = 2/3 (Zbf - Zout) = 2/3 (675.03 - 674.5) = 0.35 FT

Ao = QaveBF / (0.62(2 g h_ave_us)^0.5) = 0.35 / (0.62(2 x 32.2 x 0.35)^0.5) = 0.119 SFT

do = 1.5 inch = 0.125 FT
Therefore, Ao = 0.0123 SFT

The required number of 1.5 inch dia. holes is then 0.119 / 0.0123 = **9.7 holes**
Therefore, use 10 at elevation 674.5.

The actual average release rate through the orifice is, Qave_bf:

Qave_bf = 0.62 x Ao ((2 g h_ave_bf)^0.5)
0.62 x 10 x 0.0123((2 x 32.2 x 0.35)^0.5)
= 0.362 CFS

Actual holding time for the bank full flood excluding the forebay volume is, Tbf:

Tbf = (VtBF - VtFF) / (Qave_bf x 3600)
= (24943 - 8774) / (0.362 x 3600) = 12.4 HRS

Actual holding time for the bank full flood including the forebay volume is, T:

T = Tff + Tbf = 27.1 + 12.4 = 39.5 HRS
T < 40 HRS, OK!

Check of Forebay Design Assumption

In sizing the forebay outlet pipe and orifice restrictor it was assumed that the forebay riser outlet pipe was flowing full at the average release rate for the first flush storage volume. Therefore it is necessary to verify that the sizing of the bank full orifi do not conflict with this assumption. The bank full orifi must pass the actual average release rate for the forebay at a detention basin head that does not exceed the downstream crown elevation of the forebay riser outlet pipe.

The downstream crown elevation of the forebay riser outlet pipe is 674.87

Use the orifice equation to determine the detention basin head for this condition.

h = [Qave_ff /(0.62 x A)]^2 /(2 x g)
h = [0.09 / (0.62 x 10 x 0.0123)]^2 /(2 x 32.2)
h = 0.02 FT

Based on the bank full orifi as designed, the water surface elevation in the detention basin is: **674.52**

674.52 < 674.87 therefore, OK.

Riser Outlet Pipe and Orifice Restrictor Sizing

The riser outlet pipe and orifice restrictor will be sized to convey the desired maximum allowable release rate (for the 100 year flood) at the flood control storage elevation in the detention basin. A number of orifi will be placed in the riser above the bank full flood elevation but will not serve as a restrictor for the maximum release rate.

Qmax = Qa = 1.77 CFS (from storage volume calculations)

h_max = Z100 - Zout

where: Zout = upstream crown elevation of riser outlet pipe (ft) assuming the outlet pipe is designed to flow full at 1.77 CFS.

Determine the riser outlet pipe diameter to achieve the maximum release rate.

Assume an outlet pipe diameter of: 10 inches
Then, d_out = 0.83 FT

Zout = 674.5 + 0.83 = 675.33 FT

h_max = 675.71 - 675.33 = 0.38 FT

Aout = Qmax / (0.62(2 g h_max)^0.5) =1.77/(0.62(2 x 32.2 x 0.38)^0.5) = 0.577 SFT

Therefore, the orifice diameter will be:

Do = 2 (Aout/Pi)^0.5 = 2 (0.577/Pi)^0.5 = 0.86 FT, or 10 Inches

Do = 10 inches = 0.833 FT

Which has an orifice area of: **Ao = 0.545 SFT**

Dout = 10 inches = 0.833 FT

Which has an orifice area of: **Aout = 0.545 SFT**

The actual maximum release rate through the orifice restrictor and outlet pipe is:

Qmax = 0.62 (Ao) ((2 g h_max)^0.5)
= 0.62 (0.545) ((2 x 32.2 x 0.38)^0.5)
= 1.67 CFS

Qave_ff of 1.67 CFS < desired rate of 1.77 CFS, therefore OK.

Riser Outlet Pipe Slope

Determine riser outlet pipe slope to be consistent with earlier assumption that it is flowing full at the actual maximum release rate. Use Manning's equation with n = 0.012 for PVC pipe.

Slope (ft/ft) = [(Qmax x n)/(1.486 x Aout x R^2/3)]^2

where, **R = Dout / 4 = 0.833 / 4 = 0.208 FT**

So, **Slope (ft/ft) = [(1.67 x 0.012)/(1.486 x 0.545 x 0.208^2/3)]^2**

Slope = 0.005 FT/FT
= 0.5 %

Therefore, use a 10 inch PVC pipe at 0.5% slope.

Check velocity at full pipe flow condition against minimum and maximum allowable closed conduit velocities.

V = Qmax / Aout = 1.67 / 0.545 = 3.06 FPS

3.06 < Vmax of 8 FPS therefore, OK.

3.06 > Vmin of 2.5 FPS therefore, OK.

Emergency Overflow Weir

Determine unrestricted flow over site from a 10-Year storm event using the rational method:

Area of the site: **11.79 Acres**

Overall site C factor: **0.41**

Time of concentration, t (from storm calcs): **20.19 minutes**

Assumed minimum initial time: **15 minutes**

Rainfall Intensity, I=151.8/(t+15) = 4.31 in/hr

Flow, Q10 = C I A = 0.41 x 4.31 x 11.79 = **20.83 CFS**

Equation for trapazoidal Weir Design:

Q10 = 3.367 x b x h^(3/2)

Solve above equation for the bottom width, b:

b = Q10 / (3.367 x h^(3/2))

Assume depth of flow over weir, h = **1.00 ft**

Therefore, minimum bottom width of Weir is:

b= 6.19 ft

PROPOSED ECDC SITE - STORM SEWER DRAINAGE CALCULATIONS - BRANCH "C"

(REFER TO SHEET C3.6 FOR DRAINAGE MAP)

(User) MANHOLE From	To	(User) Area Name	(User) Area Added ("A")	(Calc) Accm Area	(User) Imperv. ("C")	(Calc) Equiv. Area (AxC)	(Calc) Accm. Equiv. Area	(User) ("T")	(Calc) ("I") Inten. In./Hr	(Calc) ("Q") Runoff (CFS)	(User) D Diam. (in.)	(Calc) Min HG based on Q %	(Calc) HG for 2.5 fps given D	(User) Pipe Slope (%)	(Calc) Actual HG (%)	(Calc) "V" fps Vel.@ HG	(Calc) Cap. Prov. (CFS)	(User) L Pipe Length	(Calc) Time of Flow (min)	Jump at MH (dn) ?	Invert Elev. at Up MH	Invert Elev. at Down MH	HG Elev. at Up MH	HG Elev. at Down MH	Up MH Rim	Depth RIM-T/P	DN MH Rim	Depth RIM-T/P	H.G. TO RIM(Up)	H.G. TO RIM(Dn)
ROOF	MH C4	ROOF	0.71	0.71	0.95	0.67	0.67	15.00	4.35	2.93	10	1.79	0.42	0.50	1.79	5.38	2.93	105	0.33	2.88	674.50	673.97	676.84	674.96	678.50	3.17	677.35	2.55	1.66	2.39
MAIN BRANCH																														
FCB C9	FCB C8	C9	0.27	0.27	0.50	0.14	0.14	15.00	4.35	0.59	12	0.03	0.32	0.32	0.32	2.57	2.02	90	0.58		672.20	671.91	676.20	675.91	676.70	3.50	676.70	3.79	0.50	0.79
FCB C8	FCB C7	C8	0.16	0.43	0.57	0.09	0.23	15.58	4.28	0.97	12	0.07	0.32	0.32	0.32	2.57	2.02	118	0.77		671.91	671.53	675.91	675.53	676.70	3.79	676.70	4.17	0.79	1.17
FCB C7	CB C6	C7	0.21	0.64	0.60	0.13	0.35	16.35	4.19	1.47	15	0.05	0.24	0.24	0.24	2.58	3.16	122	0.79		671.33	671.04	675.53	675.24	676.70	4.12	676.70	4.41	1.17	1.46
CB C6	CB C5	C6	0.80	1.44	0.75	0.60	0.95	17.14	4.10	3.90	18	0.14	0.18	0.18	0.18	2.52	4.46	120	0.79		670.84	670.62	675.24	675.02	676.70	4.36	676.70	4.58	1.46	1.68
CB C5	MH C4	C5	1.02	2.46	0.48	0.49	1.44	17.93	4.01	5.79	21	0.13	0.14	0.14	0.14	2.46	5.93	45	0.30		670.42	670.36	675.02	674.96	676.70	4.53	677.35	5.24	1.68	2.39
MH C4	FCB C3	-	0.00	3.17	0.00	0.00	2.12	18.24	3.98	8.42	27	0.07	0.10	0.10	0.10	2.46	9.79	195	1.32		669.96	669.76	674.96	674.76	677.35	5.14	676.20	4.19	2.39	1.44
FCB C3	FCB C2	C3	1.56	4.73	0.15	0.23	2.35	19.56	3.85	9.04	27	0.09	0.10	0.10	0.10	2.46	9.79	94	0.64		669.76	669.67	674.76	674.67	676.20	4.19	676.20	4.28	1.44	1.53
FCB C2	ES C1	C2	0.98	5.71	0.15	0.15	2.50	20.19	3.79	9.46	27	0.09	0.10	0.10	0.10	2.46	9.79	166	1.12		669.67	669.50	674.67	674.50	676.20	4.28	674.50	2.75	1.53	

PROPOSED ECDC SITE - STORM SEWER DRAINAGE CALCULATIONS - BRANCH "D"

(REFER TO SHEET C3.6 FOR DRAINAGE MAP)

(User) MANHOLE From	To	(User) Area Name	(User) Area Added ("A")	(Calc) Accm Area	(User) Imperv. ("C")	(Calc) Equiv. Area (AxC)	(Calc) Accm. Equiv. Area	(User) ("T")	(Calc) ("I") Inten. In./Hr	(Calc) ("Q") Runoff (CFS)	(User) D Diam. (in.)	(Calc) Min HG based on Q %	(Calc) HG for 2.5 fps given D	(User) Pipe Slope (%)	(Calc) Actual HG (%)	(Calc) "V" fps Vel.@ HG	(Calc) Cap. Prov. (CFS)	(User) L Pipe Length	(Calc) Time of Flow (min)	Jump at MH (dn) ?	Invert Elev. at Up MH	Invert Elev. at Down MH	HG Elev. at Up MH	HG Elev. at Down MH	Up MH Rim	Depth RIM-T/P	DN MH Rim	Depth RIM-T/P	H.G. TO RIM(Up)	H.G. TO RIM(Dn)
FCB D3.2	FCB D3.1	D3.2	0.44	0.44	0.23	0.10	0.10	15.00	4.35	0.44	12	0.02	0.32	0.32	0.32	2.57	2.02	97	0.63		671.98	671.67	675.58	675.27	676.20	3.22	676.10	3.43	0.62	0.83
FCB D3.1	FCB D3	D3.1	0.45	0.89	0.18	0.08	0.18	15.63	4.27	0.78	12	0.05	0.32	0.32	0.32	2.57	2.02	97	0.63		671.67	671.36	675.27	674.96	676.10	3.43	676.10	3.74	0.83	1.14
MAIN BRANCH																														
FCB D6	FCB D5	D6	0.52	0.52	0.52	0.27	0.27	15.00	4.35	1.18	12	0.11	0.32	0.32	0.32	2.57	2.02	88	0.57		672.19	671.91	675.79	675.51	676.50	3.31	676.50	3.59	0.71	0.99
FCB D5	MH D4	D5	0.49	1.01	0.59	0.29	0.56	15.57	4.28	2.39	15	0.14	0.24	0.24	0.24	2.58	3.16	112	0.72		671.71	671.44	675.51	675.24	676.50	3.54	677.44	4.75	0.99	2.20
MH D4	FCB D3	-	0.00	1.01	0.00	0.00	0.56	16.30	4.19	2.35	15	0.13	0.24	0.24	0.24	2.58	3.16	115	0.74		671.44	671.16	675.24	674.96	677.44	4.75	676.10	3.69	2.20	1.14
FCB D3	FCB D2	D3	0.74	2.64	0.16	0.12	0.86	17.04	4.11	3.53	18	0.11	0.18	0.18	0.18	2.52	4.46	123	0.81		670.96	670.74	674.96	674.74	676.10	3.64	677.00	4.76	1.14	2.26
FCB D2	ES D1	D2	0.10	2.74	0.15	0.02	0.88	17.85	4.02	3.52	18	0.11	0.18	0.18	0.18	2.52	4.46	135	0.89		670.74	670.50	674.74	674.50	677.00	4.76	674.50	2.50	2.26	

EXISTING BELLEVILLE HIGH SCHOOL SITE - STORM SEWER DRAINAGE CALCULATIONS

CALCULATIONS PROVIDED TO CONFIRM EFFECT OF NEW ECDC STORM SEWER SYSTEM FLOW ON EXISTING HIGH SCHOOL SYSTEM. ORIGINAL STORM CALCULATIONS WERE RECREATED USING ORIGINAL HIGH SCHOOL PROJECT PLANS FOR STORM SEWER INFORMATION (PIPE SIZE, SLOPES, INVERT, ETC.) AS WELL AS LIMITED FIELD SURVEY INFORMATION COLLECTED ON THE HIGH SCHOOL'S SYSTEM AS PART OF THE CURRENT ECDC PROJECT. REFER TO BELLEVILLE HIGH SCHOOL REFERENCE SHEETS FOR INFORMATION ON EXISTING STORM SEWER SYSTEM USED IN THESE CALCULATIONS.

(User) MANHOLE From	To	(User) Area Name	(User) Area Added ("A")	(Calc) Accm Area	(User) Imperv. ("C")	(Calc) Equiv. Area (AxC)	(Calc) Accm. Equiv. Area	(User) ("T")	(Calc) ("I") Inten. In./Hr	(Calc) ("Q") Runoff (CFS)	(User) D Diam. (in.)	(Calc) Min HG based on Q %	(Calc) HG for 2.5 fps given D	(User) Pipe Slope (%)	(Calc) Actual HG (%)	(Calc) "V" fps Vel.@ HG	(Calc) Cap. Prov. (CFS)	(User) L Pipe Length	(Calc) Time of Flow (min)	Jump at MH (dn) ?	Invert Elev. at Up MH	Invert Elev. at Down MH	HG Elev. at Up MH	HG Elev. at Down MH	Up MH Rim	Depth RIM-T/P	DN MH Rim	Depth RIM-T/P	H.G. TO RIM(Up)	H.G. TO RIM(Dn)
CB 3	CB 4	3	0.66	0.66	0.25	0.17	0.17	15.00	4.35	0.72	12	0.04	0.32	0.45	0.04	0.91	0.72	154	2.80		673.77	673.08	674.27	674.21	676.50	1.73	676.50	2.42	2.23	2.29
CB 6	CB 7	6	0.78	0.78	0.48	0.37	0.37	15.00	4.35	1.63	12	0.21	0.32	1.00	0.21	2.07	1.63	66	0.53		673.17	672.50	674.05	673.91	677.00	2.83	677.25	3.75	2.95	3.34
ECDC	**CB 9**	**NEW**	0.65	0.65	0.50	0.32	0.32	15.00	4.35	**1.60**	**10**	0.53	0.42	**0.46**	0.53	2.93	1.60	**159**	0.90	1.02	**674.50**	**673.77**	**675.29**	**674.44**	**675.68**	**0.35**	**676.88**	**2.28**	**0.39**	**2.44**
CB 9	CB 10	9	0.27	0.92	0.28	0.08	0.40	15.90	4.24	1.69	12	0.22	0.32	0.23	0.23	2.18	1.71	133	1.02		672.62	672.31	674.09	673.78	676.88	3.26	677.25	3.94	2.79	3.47
CB 14	CB 15	14	0.22	0.22	0.25	0.06	0.06	15.00	4.35	0.24	12	0.00	0.32	1.25	0.00	0.30	0.24	103	5.61		673.05	671.76	673.08	673.08	676.25	2.20	676.25	3.49	3.17	3.17
CB 16	CB 17	16	0.39	0.39	0.82	0.32	0.32	15.00	4.35	1.39	12	0.15	0.32	1.30	0.15	1.77	1.39	107	1.00		673.05	671.67	673.10	672.94	676.25	2.20	676.25	3.58	3.15	3.31
CB 18	CB 19	18	0.63	0.63	0.85	0.54	0.54	15.00	4.35	2.33	12	0.43	0.32	1.15	0.43	2.97	2.33	148	0.83		673.05	671.36	673.15	672.52	676.25	2.20	676.25	3.89	3.10	3.73
CB 24	CB 25	24	0.28	0.28	0.81	0.23	0.23	15.00	4.35	0.99	12	0.08	0.32	1.50	0.08	1.26	0.99	66	0.88		673.54	672.55	673.59	673.54	676.75	2.21	676.75	3.20	3.16	3.21
CB 26	CB 27	26	0.26	0.26	0.95	0.25	0.25	15.00	4.35	1.07	12	0.09	0.32	2.00	0.09	1.37	1.07	64	0.78		673.50	672.22	673.08	673.02	676.75	2.25	676.75	3.53	3.67	3.73
CB 21	CB 22	21	0.25	0.25	0.62	0.16	0.16	15.00	4.35	0.67	12	0.04	0.32	0.30	0.04	0.86	0.67	63	1.23		673.56	673.37	674.19	674.17	676.75	2.19	676.75	2.38	2.56	2.58
CB 22	CB 23	22	0.13	0.38	0.74	0.10	0.25	16.23	4.20	1.06	12	0.09	0.32	0.30	0.09	1.34	1.06	125	1.55		673.37	672.99	673.90	673.79	676.75	2.38	676.75	2.76	2.85	2.96
CB 23	CB 25	23	0.12	0.50	0.76	0.09	0.34	17.78	4.03	1.38	12	0.15	0.32	0.30	0.15	1.76	1.38	147	1.40		672.99	672.55	673.76	673.54	676.75	2.76	676.75	3.20	2.99	3.21
CB 25	CB 27	25	0.34	1.12	0.87	0.30	0.87	19.18	3.88	3.36	15	0.27	0.24	0.28	0.27	2.74	3.36	117	0.71		672.55	672.22	673.54	673.22	676.75	2.95	676.75	3.28	3.21	3.53
CB 27	CB 28	27	0.28	1.66	0.95	0.27	1.38	19.89	3.81	5.26	15	0.66	0.24	1.25	0.66	4.28	5.26	117	0.46		672.22	670.76	672.95	672.18	676.75	3.28	676.75	4.74	3.80	4.57
CB 1	CB 2	1	0.58	0.58	0.25	0.15	0.15	15.00	4.35	0.63	12	0.03	0.32	0.30	0.03	0.80	0.63	111	2.31		673.80	673.47	674.33	674.30	676.50	1.70	677.00	2.53	2.17	2.70
CB 2	CB 4	2	0.13	0.71	0.61	0.08	0.22	17.31	4.08	0.92	12	0.07	0.32	0.30	0.07	1.17	0.92	130	1.85		673.47	673.08	674.30	674.21	677.00	2.53	676.50	2.42	2.70	2.29
CB 4	CB 5	4	0.56	1.93	0.35	0.20	0.59	19.16	3.89	2.27	15	0.12	0.24	0.28	0.12	1.85	2.27	161	1.44		673.08	672.63	674.21	674.01	676.50	2.17	676.50	2.62	2.29	2.49
CB 5	CB 7	5	1.22	3.15	0.44	0.54	1.12	20.61	3.75	4.21	18	0.16	0.18	1.00	0.16	2.38	4.21	62	0.44		672.63	672.00	674.01	673.91	676.50	2.37	677.25	3.75	2.49	3.34
CB 7	CB 8	7	0.27	4.20	0.56	0.15	1.65	21.04	3.71	6.11	24	0.07	0.12	0.11	0.07	1.94	6.11	104	0.89		671.50	671.39	673.91	673.83	677.25	3.75	678.65	5.26	3.34	4.82
CB 8	CB 10	8	0.07	4.27	0.45	0.03	1.68	21.93	3.63	6.09	24	0.07	0.12	0.11	0.07	1.94	6.09	69	0.59		671.39	671.31	673.83	673.78	678.65	5.26	677.25	3.94	4.82	3.47
CB 10	CB 11	10	0.49	5.68	0.34	0.17	2.24	22.52	3.58	8.03	24	0.13	0.12	0.11	0.13	2.56	8.03	178	1.16		671.31	671.12	673.78	673.56	677.25	3.94	677.75	4.63	3.47	4.19
CB 11	CB 12	11	0.54	6.22	0.32	0.17	2.42	23.69	3.48	8.42	24	0.14	0.12	0.11	0.14	2.68	8.42	93	0.58		671.12	671.01	673.56	673.43	677.75	4.63	677.60	4.59	4.19	4.17
CB 12	CB 13	12	0.34	6.56	0.29	0.10	2.52	24.27	3.44	8.64	24	0.15	0.12	0.11	0.15	2.75	8.65	85	0.51		671.01	670.92	673.43	673.31	677.60	4.59	677.00	4.08	4.17	3.69
CB 13	CB 15	13	0.48	7.04	0.28	0.13	2.65	24.78	3.40	9.00	24	0.16	0.12	0.11	0.16	2.87	9.00	142	0.83		670.92	670.76	673.31	673.08	677.00	4.08	676.25	3.49	3.69	3.17
CB 15	CB 17	15	0.32	7.58	0.64	0.20	2.91	25.61	3.34	9.71	24	0.18	0.12	0.13	0.18	3.09	9.71	74	0.40		670.76	670.67	673.08	672.94	676.25	3.49	676.25	3.58	3.17	3.31
CB 17	CB 19	17	0.40	8.37	0.83	0.33	3.56	26.01	3.31	11.78	24	0.27	0.12	0.20	0.27	3.75	11.78	157	0.70		670.67	670.36	672.94	672.52	676.25	3.58	676.25	3.89	3.31	3.73
CB 19	CB 20	19	0.73	9.73	0.87	0.64	4.73	26.70	3.26	15.41	30	0.14	0.09	0.15	0.14	3.14	15.41	168	0.89		669.86	669.60	672.52	672.28	676.25	3.89	676.75	4.65	3.73	4.47
CB 20	CB 28	20	0.39	10.12	0.88	0.34	5.08	27.60	3.20	16.22	30	0.16	0.09	0.15	0.16	3.30	16.22	64	0.32		669.60	669.51	672.28	672.18	676.75	4.65	676.75	4.74	4.47	4.57
CB 28	ES	28	0.39	12.17	0.88	0.34	6.80	27.92	3.17	21.57	30	0.28	0.09	0.15	0.28	4.40	21.57	138	0.52		669.51	669.30	672.18	671.80	676.75	4.74	673.80	2.00	4.57	2.00

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Project Title

Van Buren Public Schools

The Early Childhood Development Center
Davis St.
Belleville, MI 48111

Project Administrator	V. Grant
Project Designer	J. Ensley
Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
Q.M. Review	T. Sovel
Approved	T. Sovel
Drawing Scale	As Noted

Issued for	Issue Date
Design Development	06-19-2020
Bid Package 1	08-14-2020
Addendum No. 3	09-08-2020
City Engineering Review No. 2	11-02-2020
Bulletin No. 1	11-04-2020
City Engineering Review No. 3	11-18-2020
City Engineering Revisions	12-07-2020
EGLE Water Supply Permit	12-07-2020
Bulletin No. 1 Revised	12-08-2020

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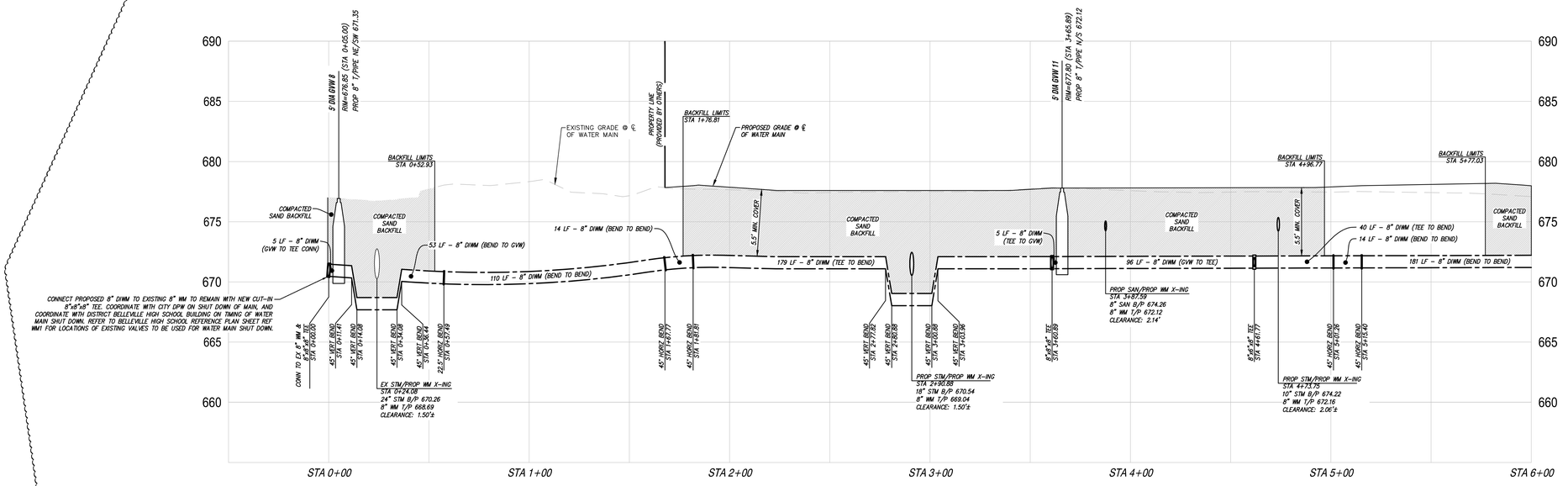
IDS Drawing Title

Storm Sewer and Detention Calculations

IDS Project Number: 20111-1000

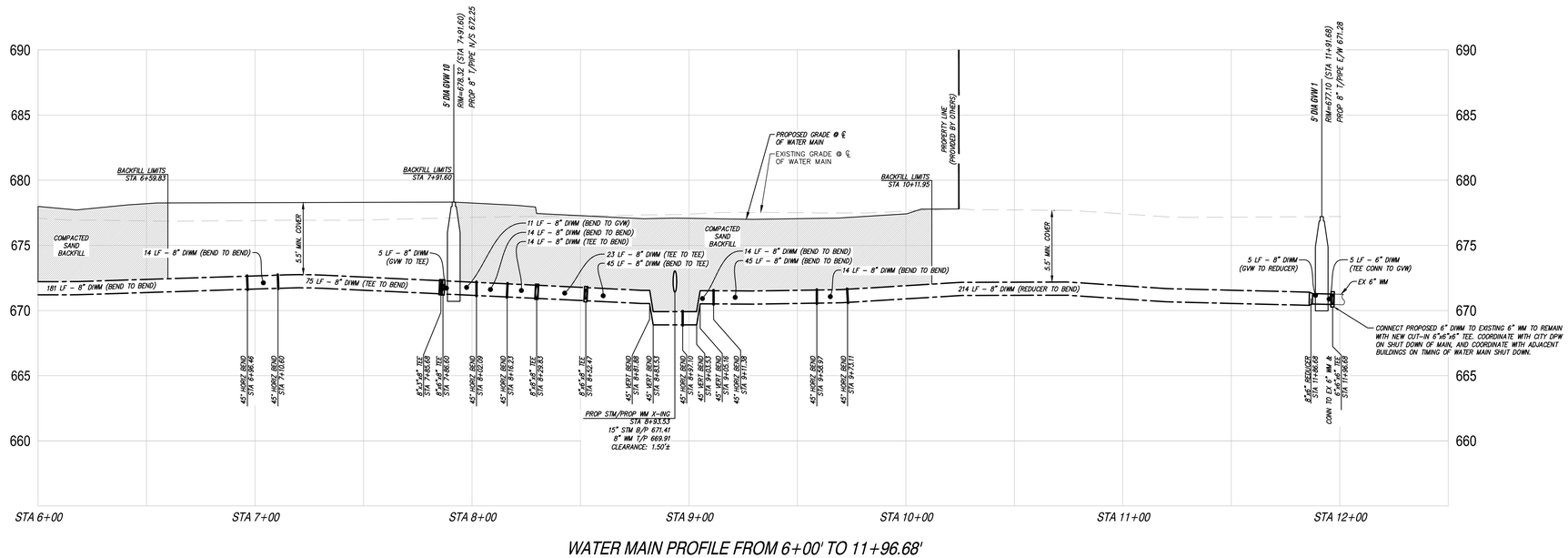
SDA Project No. NP20062

Drawing Number: C3.7



WATER MAIN PROFILE FROM 0+00' TO 6+00'

SCALE: 1"=30'(H)
1"=5'(V)



WATER MAIN PROFILE FROM 6+00' TO 11+96.68'

SCALE: 1"=30'(H)
1"=5'(V)

REFER TO SHEETS C3.1 AND C3.2 FOR WATER MAIN PLAN VIEW AND NOTES

IDS

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EGLE Water Supply Permit	12-07-2020
Bulletin No. 1 Revised	12-08-2020

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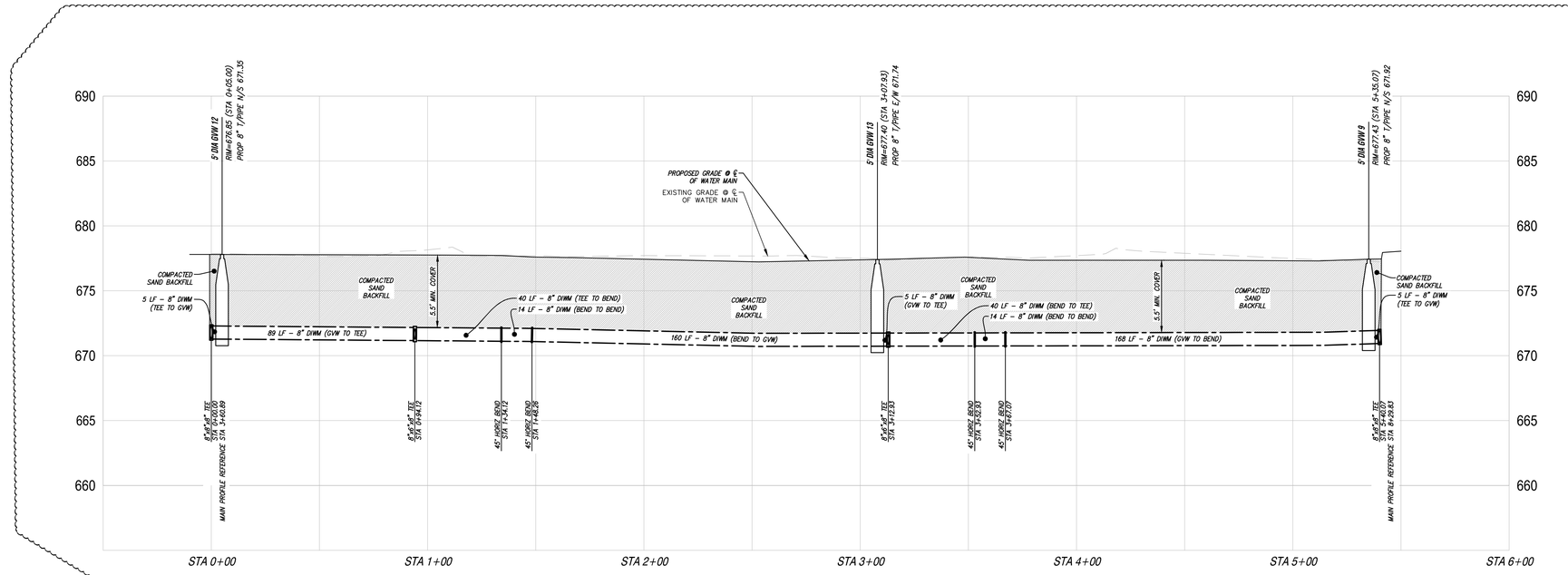
IDS Drawing Title

Water Main Profiles

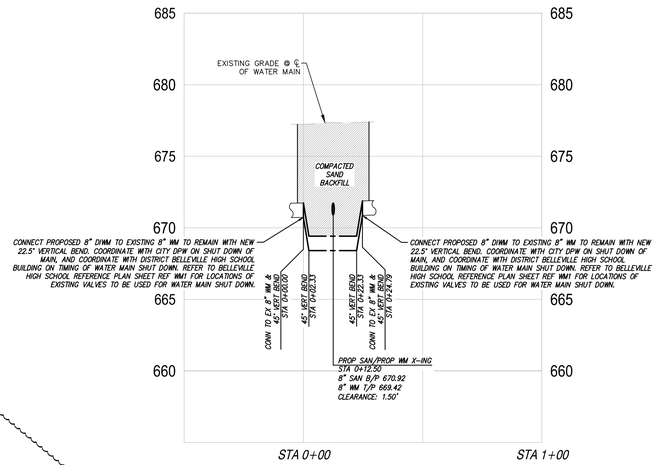
IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C3.8



WATER MAIN PROFILE FROM 0+00' TO 5+40.07'

SCALE: 1"=30'(H)
1"=5'(V)



WATER MAIN PROFILE FROM 0+00' TO 0+24.79'

SCALE: 1"=30'(H)
1"=5'(V)

REFER TO SHEETS C3.1 AND C3.2 FOR WATER MAIN PLAN VIEW AND NOTES

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Project Title

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Davis St.
Belleville, MI 48111

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V. Grant
Project Designer
J. Ensley
Project Architect / Engineer
J. Ensley
Drawn By
C. Yang
Q.M. Review
T. Sovel
Approved
T. Sovel
Drawing Scale
As Noted

Issued for	Issue Date
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Bulletin No. 1 Revised	12-08-2020

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Water Main Profiles

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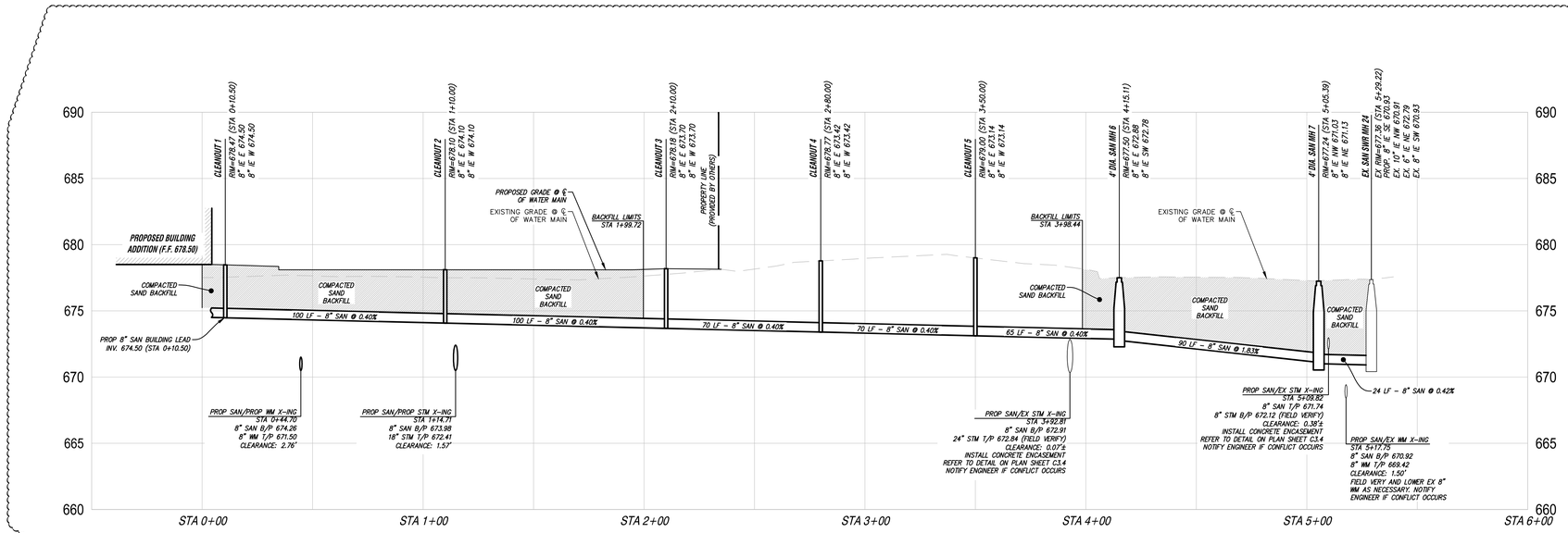
Drawing Number
C3.9



SANITARY SEWER PROFILE FROM BUILDING LEAD TO EX. SANITARY SEWER MH

SCALE: 1"=30'(H)
1"=5'(V)

REFER TO SHEETS C3.1 AND C3.2 FOR SANITARY SEWER PLAN VIEW AND NOTES

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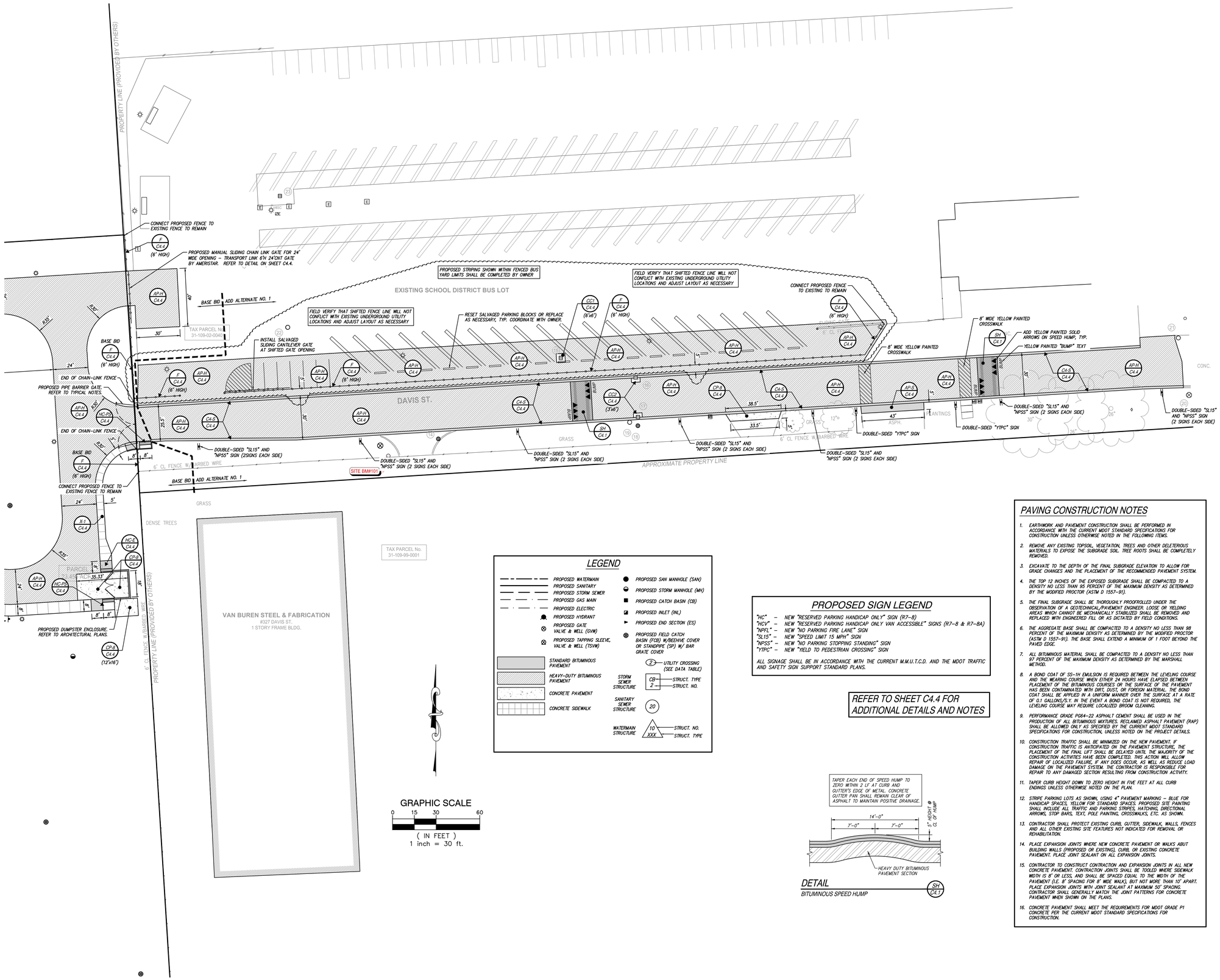
IDS Drawing Title

Sanitary Sewer Profiles

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C3.10



LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- 2 — UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 XXX — STRUCT. NO. / STRUCT. TYPE

GRAPHIC SCALE

0 15 30 60

(IN FEET)

1 inch = 30 ft.

PROPOSED SIGN LEGEND

"HC" – NEW "RESERVED PARKING HANDICAP ONLY" SIGN (R7-8)
"HCV" – NEW "RESERVED PARKING HANDICAP ONLY VAN ACCESSIBLE" SIGNS (R7-8 & R7-8A)
"NPFL" – NEW "NO PARKING FIRE LANE" SIGN
"SL15" – NEW "SPEED LIMIT 15 MPH" SIGN
"NPSS" – NEW "NO PARKING STOPPING STANDING" SIGN
"YIPC" – NEW "YIELD TO PEDESTRIAN CROSSING" SIGN

ALL SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT M.M.U.T.C.D. AND THE MDOT TRAFFIC AND SAFETY SIGN SUPPORT STANDARD PLANS.

REFER TO SHEET C4.4 FOR ADDITIONAL DETAILS AND NOTES

DETAIL
BITUMINOUS SPEED HUMP (SH C4.1)

PAVING CONSTRUCTION NOTES

1. EARTHWORK AND PAVEMENT CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION UNLESS OTHERWISE NOTED IN THE FOLLOWING ITEMS.
2. REMOVE ANY EXISTING TOPSOIL, VEGETATION, TREES AND OTHER DELETERIOUS MATERIALS TO EXPOSE THE SUBGRADE SOIL. TREE ROOTS SHALL BE COMPLETELY REMOVED.
3. EXCAVATE TO THE DEPTH OF THE FINAL SUBGRADE ELEVATION TO ALLOW FOR GRADE CHANGES AND THE PLACEMENT OF THE RECOMMENDED PAVEMENT SYSTEM.
4. THE TOP 12 INCHES OF THE EXPOSED SUBGRADE SHALL BE COMPACTED TO A DENSITY NO LESS THAN 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR (ASTM D 1557–91).
5. THE FINAL SUBGRADE SHALL BE THOROUGHLY PROOFROLLED UNDER THE OBSERVATION OF A GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS WHICH CANNOT BE MECHANICALLY STABILIZED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DICTATED BY FIELD CONDITIONS.
6. THE AGGREGATE BASE SHALL BE COMPACTED TO A DENSITY NO LESS THAN 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR (ASTM D 1557–91). THE BASE SHALL EXTEND A MINIMUM OF 1 FOOT BEYOND THE PAVED EDGE.
7. ALL BITUMINOUS MATERIAL SHALL BE COMPACTED TO A DENSITY NO LESS THAN 97 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE MARSHALL METHOD.
8. A BOND COAT OF SS–1H EMULSION IS REQUIRED BETWEEN THE LEVELING COURSE AND THE WEARING COURSE WHEN EITHER 24 HOURS HAVE ELAPSED BETWEEN PLACEMENT OF THE BITUMINOUS COURSES OR THE SURFACE OF THE PAVEMENT HAS BEEN CONTAMINATED WITH DIRT, DUST, OR FOREIGN MATERIAL. THE BOND COAT SHALL BE APPLIED IN A UNIFORM MANNER OVER THE SURFACE AT A RATE OF 0.1 GALLONS/S.Y. IN THE EVENT A BOND COAT IS NOT REQUIRED, THE LEVELING COURSE MAY REQUIRE LOCALIZED BROOM CLEANING.
9. PERFORMANCE GRADE PG64–22 ASPHALT CEMENT SHALL BE USED IN THE PRODUCTION OF ALL BITUMINOUS MIXTURES. RECLAIMED ASPHALT PAVEMENT (RAP) SHALL BE ALLOWED ONLY AS SPECIFIED BY THE CURRENT MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, UNLESS NOTED ON THE PROJECT DETAILS.
10. CONSTRUCTION TRAFFIC SHALL BE MINIMIZED ON THE NEW PAVEMENT. IF CONSTRUCTION TRAFFIC IS ANTICIPATED ON THE PAVEMENT STRUCTURE, THE PLACEMENT OF THE FINAL LIFT SHALL BE DELAYED UNTIL THE MAJORITY OF THE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. THIS ACTION WILL ALLOW REPAIR OF LOCALIZED FAILURE, IF ANY DOES OCCUR, AS WELL AS REDUCE LOAD DAMAGE ON THE PAVEMENT SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR REPAIR TO ANY DAMAGED SECTION RESULTING FROM CONSTRUCTION ACTIVITY.
11. TAPER CURB HEIGHT DOWN TO ZERO HEIGHT IN FIVE FEET AT ALL CURB ENDINGS UNLESS OTHERWISE NOTED ON THE PLAN.
12. STRIPE PARKING LOTS AS SHOWN, USING 4" PAVEMENT MARKING – BLUE FOR HANDICAP SPACES, YELLOW FOR STANDARD SPACES. PROPOSED SITE PAINTING SHALL INCLUDE ALL TRAFFIC AND PARKING STRIPES, HATCHING, DIRECTIONAL ARROWS, STOP BARS, TEXT, POLE PAINTING, CROSSWALKS, ETC. AS SHOWN.
13. CONTRACTOR SHALL PROTECT EXISTING CURB, GUTTER, SIDEWALK, WALLS, FENCES AND ALL OTHER EXISTING SITE FEATURES NOT INDICATED FOR REMOVAL OR REHABILITATION.
14. PLACE EXPANSION JOINTS WHERE NEW CONCRETE PAVEMENT OR WALKS ABUT BUILDING WALLS (PROPOSED OR EXISTING), CURB, OR EXISTING CONCRETE PAVEMENT. PLACE JOINT SEALANT ON ALL EXPANSION JOINTS.
15. CONTRACTOR TO CONSTRUCT CONTRACTION AND EXPANSION JOINTS IN ALL NEW CONCRETE PAVEMENT. CONTRACTION JOINTS SHALL BE TOOLED WHERE SIDEWALK WIDTH IS 8' OR LESS, AND SHALL BE SPACED EQUAL TO THE WIDTH OF THE PAVEMENT (I.E. 8' SPACING FOR 8' WIDE WALK), BUT NOT MORE THAN 10' APART. PLACE EXPANSION JOINTS WITH JOINT SEALANT AT MAXIMUM 50' SPACING. CONTRACTOR SHALL GENERALLY MATCH THE JOINT PATTERNS FOR CONCRETE PAVEMENT WHEN SHOWN ON THE PLANS.
16. CONCRETE PAVEMENT SHALL MEET THE REQUIREMENTS FOR MDOT GRADE P1 CONCRETE PER THE CURRENT MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

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Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
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Approved	T. Sovel
Drawing Scale	As Noted

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Bulletin No. 1 Revised	12-08-2020
Bulletin No. 6	06-16-2021
Bulletin No. 8	09-28-2021

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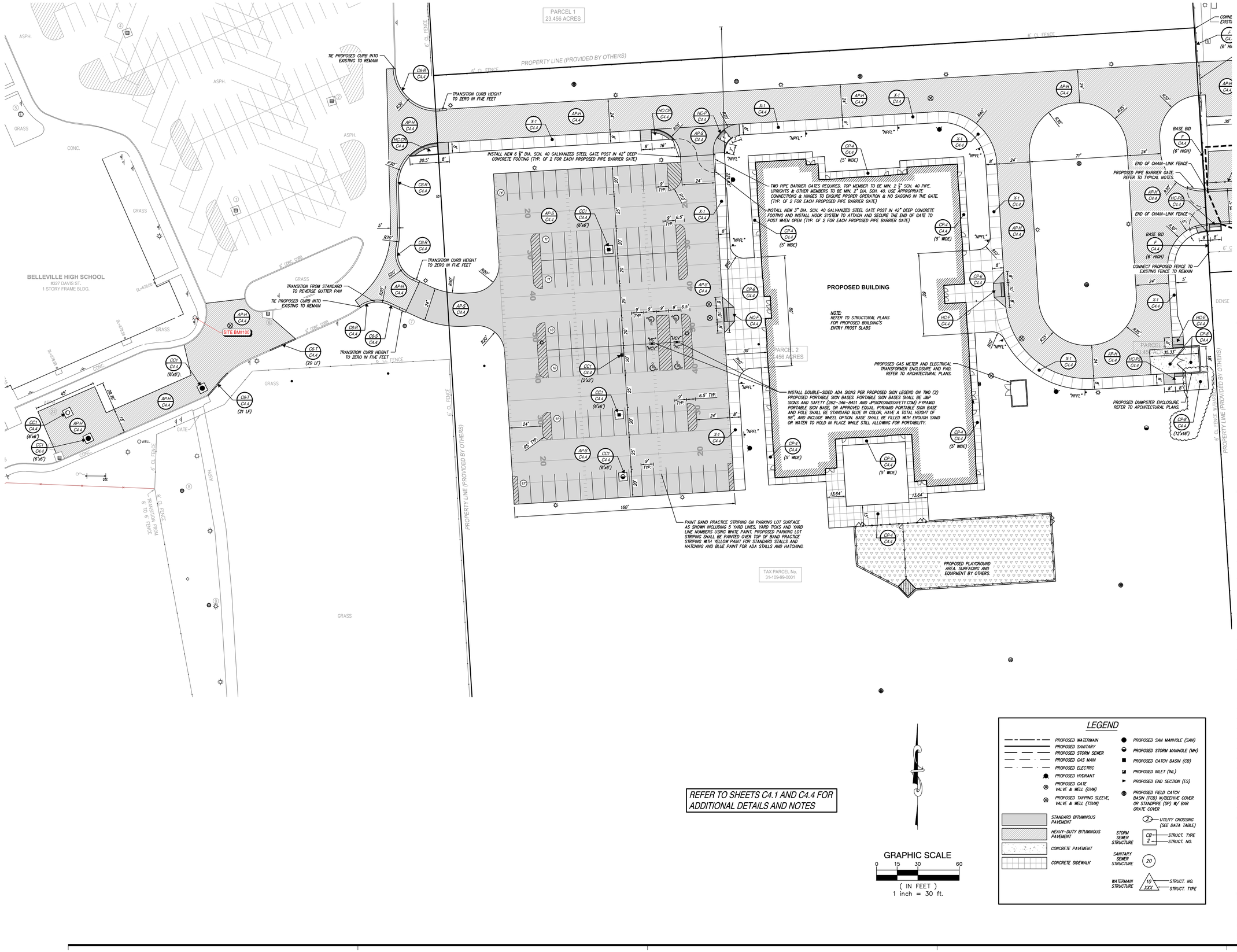
IDS Drawing Title

Paving and Layout Plan
Area "A"

IDS Project Number: 20111-1000
SDA Project No. NP20062

Drawing Number: C4.1



REFER TO SHEETS C4.1 AND C4.4 FOR ADDITIONAL DETAILS AND NOTES

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
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- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: STRUCT. TYPE, STRUCT. NO.
- SANITARY SEWER STRUCTURE
- WATERMAIN STRUCTURE: STRUCT. NO., STRUCT. TYPE

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Bulletin No. 8	09-28-2021

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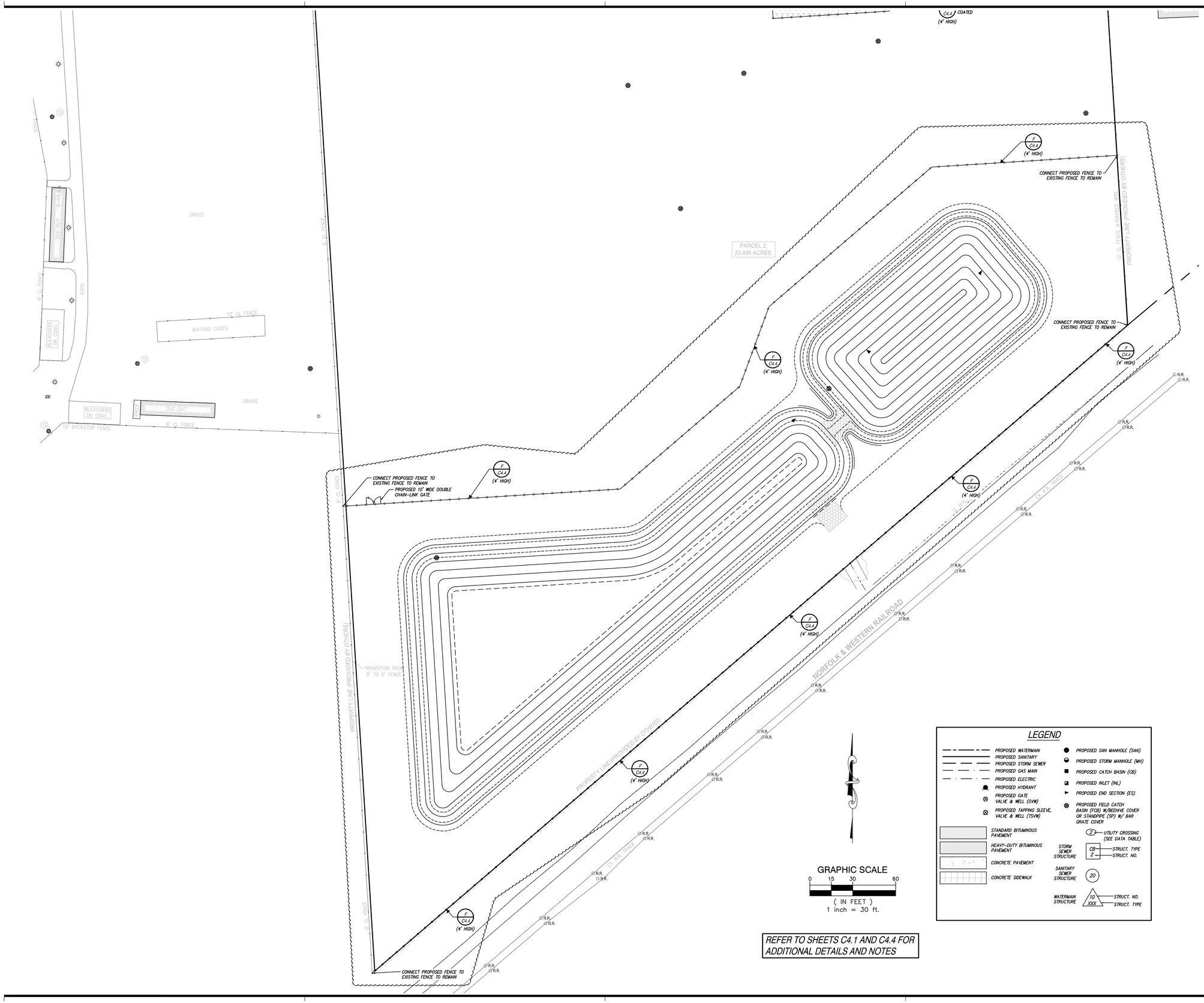
IDS Drawing Title

Paving and Layout Plan
Area "B"

IDS Project Number: **20111-1000**
SDA Project No. NP20062

Drawing Number: **C4.2**



GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

REFER TO SHEETS C4.1 AND C4.4 FOR ADDITIONAL DETAILS AND NOTES

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/RECEIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- (2) UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 XXX — STRUCT. NO. / STRUCT. TYPE

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IDS Drawing Title

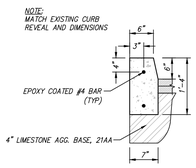
Paving and Layout Plan
Area "C"

IDS Project Number
20111-1000
SDA Project No. NP20062

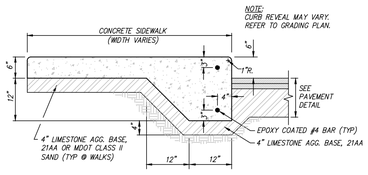
Drawing Number
C4.3

SIDEWALK RAMP NOTES (MDOT DETAIL R-28-J MODIFIED)

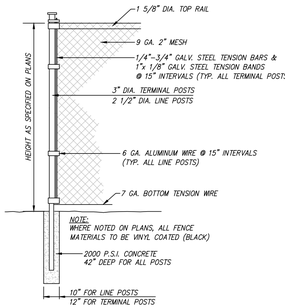
1. DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS BY ALL PUBLIC AGENCIES AND BY ALL PRIVATE ORGANIZATIONS CONSTRUCTING FACILITIES FOR PUBLIC USE.
2. SIDEWALK RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
3. SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.
4. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.
5. PROVIDE TURNING SPACES WHERE PEDESTRIAN TURNING MOVEMENTS ARE REQUIRED.
6. CURB RAMPS WITH RUNNING SLOPE EQUAL TO OR LESS THAN 5% DO NOT REQUIRE A TOP LANDING. HOWEVER, ANY CONTINUOUS SIDEWALK OR PEDESTRIAN ROUTE CROSSING THROUGH OR INTERSECTING THE CURB RAMP MUST INDEPENDENTLY MAINTAIN A CROSS SLOPE NOT GREATER THAN 2% PERPENDICULAR TO ITS OWN DIRECTION(S) OF TRAVEL.
7. DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.
8. THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH INCLUDING LANDINGS OR TRANSITIONS.
9. THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.
10. FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE SIDEWALK RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.
11. DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING. DETECTABLE WARNING PLATES TO BE RED CAST-IN-PLACE "ARMOR-TILE", OR APPROVED EQUAL, IN ACCORDANCE WITH ANSI SECTIONS 406.13 AND 705, AND ADA CODE OF REGULATION 4A.29.



DETAIL — C6-T / C4.4
6" CURB AND GUTTER STRAIGHT

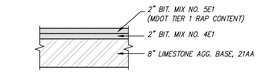


SECTION — X-1 / C4.4
INTEGRAL WALK/CURB

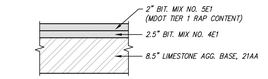


NOTE:
TERMINAL POSTS INCLUDE END, COVER, ANGLE, INTERSECTION AND INTERMEDIATE BRACED POSTS.

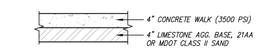
DETAIL — F / C4.4
CHAIN LINK FENCE



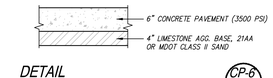
DETAIL — AP-S / C4.4
STANDARD BITUMINOUS PAVEMENT



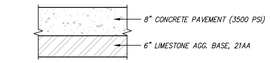
DETAIL — AP-H / C4.4
HEAVY DUTY BITUMINOUS PAVEMENT



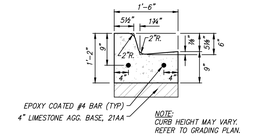
DETAIL — CP-4 / C4.4
4" CONCRETE WALK



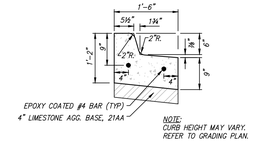
DETAIL — CP-6 / C4.4
6" CONCRETE WALK



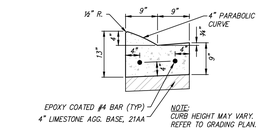
DETAIL — CP-8 / C4.4
8" CONCRETE PAVEMENT



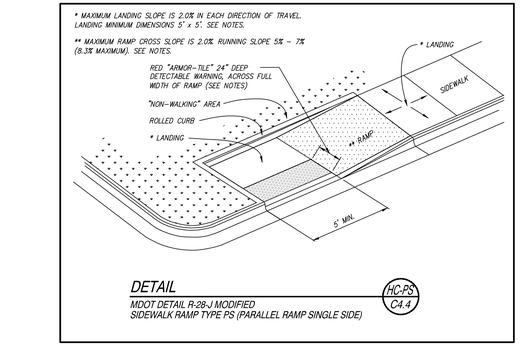
DETAIL — C6-S / C4.4
6" CURB & GUTTER STANDARD PAN (MDOT TYPE F1)



DETAIL — C6-R / C4.4
6" CURB & GUTTER REVERSE PAN (MDOT TYPE F1)

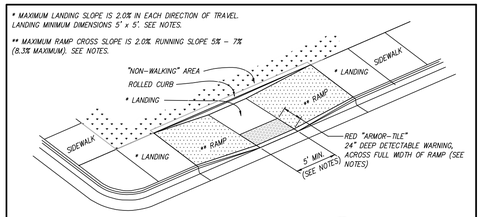


DETAIL — C4-S / C4.4
4" MOUNTABLE CURB & GUTTER STANDARD PAN

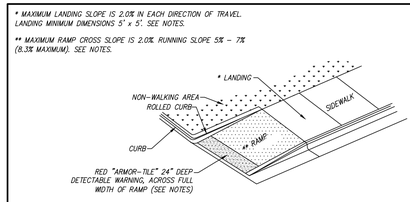


DETAIL — HC-F / C4.4
MDOT DETAIL R-28-J MODIFIED
SIDEWALK RAMP TYPE F (FLARED SIDES, TWO RAMPS SHOWN)

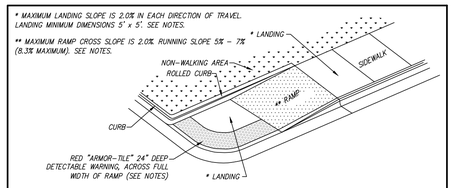
DETAIL — HC-PS / C4.4
MDOT DETAIL R-28-J MODIFIED
SIDEWALK RAMP TYPE PS (PARALLEL RAMP SINGLE SIDE)



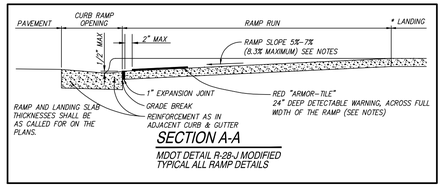
DETAIL — HC-P / C4.4
MDOT DETAIL R-28-J MODIFIED
SIDEWALK RAMP TYPE P (PARALLEL RAMP)



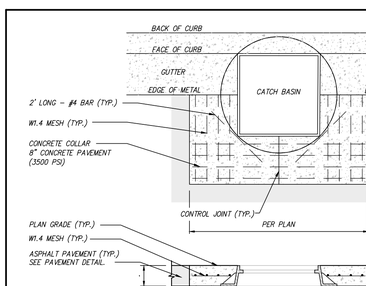
DETAIL — HC-E / C4.4
MDOT DETAIL R-28-J MODIFIED
SIDEWALK RAMP TYPE E (END OF WALK)



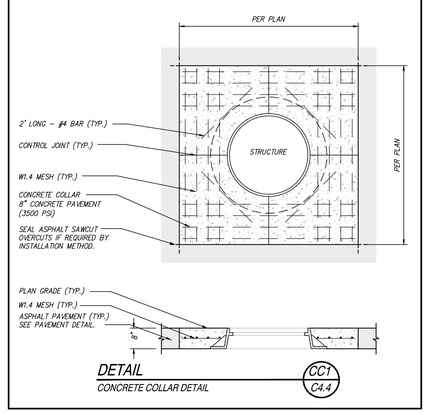
DETAIL — HC-CR / C4.4
MDOT DETAIL R-28-J MODIFIED
SIDEWALK RAMP TYPE CR (CORNER RADIUS)



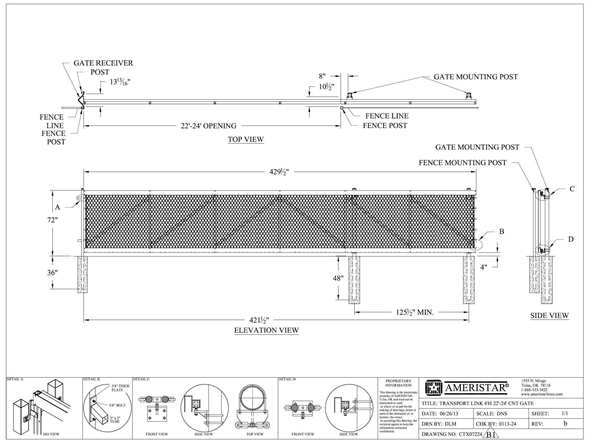
SECTION A-A
MDOT DETAIL R-28-J MODIFIED
TYPICAL ALL RAMP DETAILS



DETAIL — CC2 / C4.4
CONCRETE COLLAR AT CURB



DETAIL — CC1 / C4.4
CONCRETE COLLAR DETAIL



AMERISTAR FENCE PRODUCTS
TRANSPORT LINK – Enclosed Track Industrial Aluminum Cantilever Gate System
Construction Specification – SECTION 32 31 00

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials, and appurtenances necessary for installation of the industrial cantilever gate system defined herein at the project site.

1.02 RELATED WORK
Section 31 2000 – Earth Moving

1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total industrial ornamental aluminum cantilever gate system of the Ameristar® TransPort LINK design. Extended uprights for barb-wire are not required. The system shall include all components (i.e., tracks, uprights, bracing, pickets, hardware, fittings and fasteners) required. NOTE: CHAIN LINK FABRIC AND BARB-WIRE ARE NOT PROVIDED BY AMERISTAR. Contractor to provide chain link fabric to match adjacent proposed fencing.

1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES
- ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- ASTM D523 - Test Method for Specular Gloss.
- ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
- ASTM F1184 – Industrial & Commercial Horizontal Slide Gates

1.06 SUBMITTAL
The manufacturer's submittal package consisting of gate elevations, hardware details, and installation details, shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

PART 2 - MATERIALS
2.01 MANUFACTURER
All industrial ornamental aluminum cantilever gates shall conform to the Ameristar® TransPort LINK gate system, without extended uprights, manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma. The project gate schedule shall include the following additional information for each cantilever gate included in the project scope: 24' wide gate opening, and gate posts.

2.02 MATERIAL
A. The materials used for cantilever gate framing (i.e., uprights, diagonal braces and pickets or pales) shall be manufactured from ASTM B221 aluminum (designation 6063-T-6) with a yield strength of 25,000 PSI, a tensile strength of 30,000 PSI and a standard mill finish. The TransPort® Fast-Trak™ rails shall be manufactured from ASTM B221 aluminum (designation 6063-T-6) with minimum yield strength of 25,000 PSI, a tensile strength of 30,000 PSI and a standard mill finish.

B. Material for diagonal bracing and uprights shall be 2" sq. x ½" aluminum. The design of the top and bottom enclosed track shall conform to the manufacturers 5" x 2" Fast-Trak system. Material for chain link infill shall be per specification.

C. Internal roller track assembly shall be self-aligning swivel ball-and-socket type running on four bearing wheels. Internal roller track assembly shall be affixed to the hanger bracket by means of a 5/8" diameter industrial-grade rod end/center bolt, with a minimum static load rating of 10,000 pounds. Attachment of the center bolt to the track body shall be by means of a swivel joint to ensure equivalent and consistent loading on all bearing wheels and internal track surfaces throughout the travel of the gate.

2.03 FABRICATION
A. Enclosed track, uprights and diagonal bracing shall be pre-drilled and labeled for easy assembly. All components shall be precut to specified lengths.

B. Top and bottom rail extrusions shall be mechanically fastened to vertical uprights and reinforced with diagonal braces, as required by drawing.

C. Color coating is not required. All materials shall be galvanized.

PART 3 - EXECUTION
3.01 PREPARATION
A. All new gate installations shall be laid out by the contractor in accordance with the construction plans.

B. All hardware shall be installed in accordance with the Transport installation instructions. Transport cantilever gates shall be installed so they comply with current ASTM F2200 & UL325 standards.

C. Gate stops shall be installed on each track in a way that conforms to current ASTM F2200 standards.

3.02 GATE INSTALLATION
Gate post shall be spaced according to specified gate elevation. Posts shall be set in concrete footers having a minimum depth of 48" with a minimum diameter of 12" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.03 CLEANING
The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

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Project Title

Van Buren Public Schools

The Early Childhood Development Center

Davis St.
Belleville, MI 48111

Project Administrator	V. Grant
Project Designer	J. Ensley
Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
Q.M. Review	T. Sovel
Approved	T. Sovel
Drawing Scale	As Noted

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City Engineering Review No. 3	11-18-2020
City Engineering Revisions	12-07-2020

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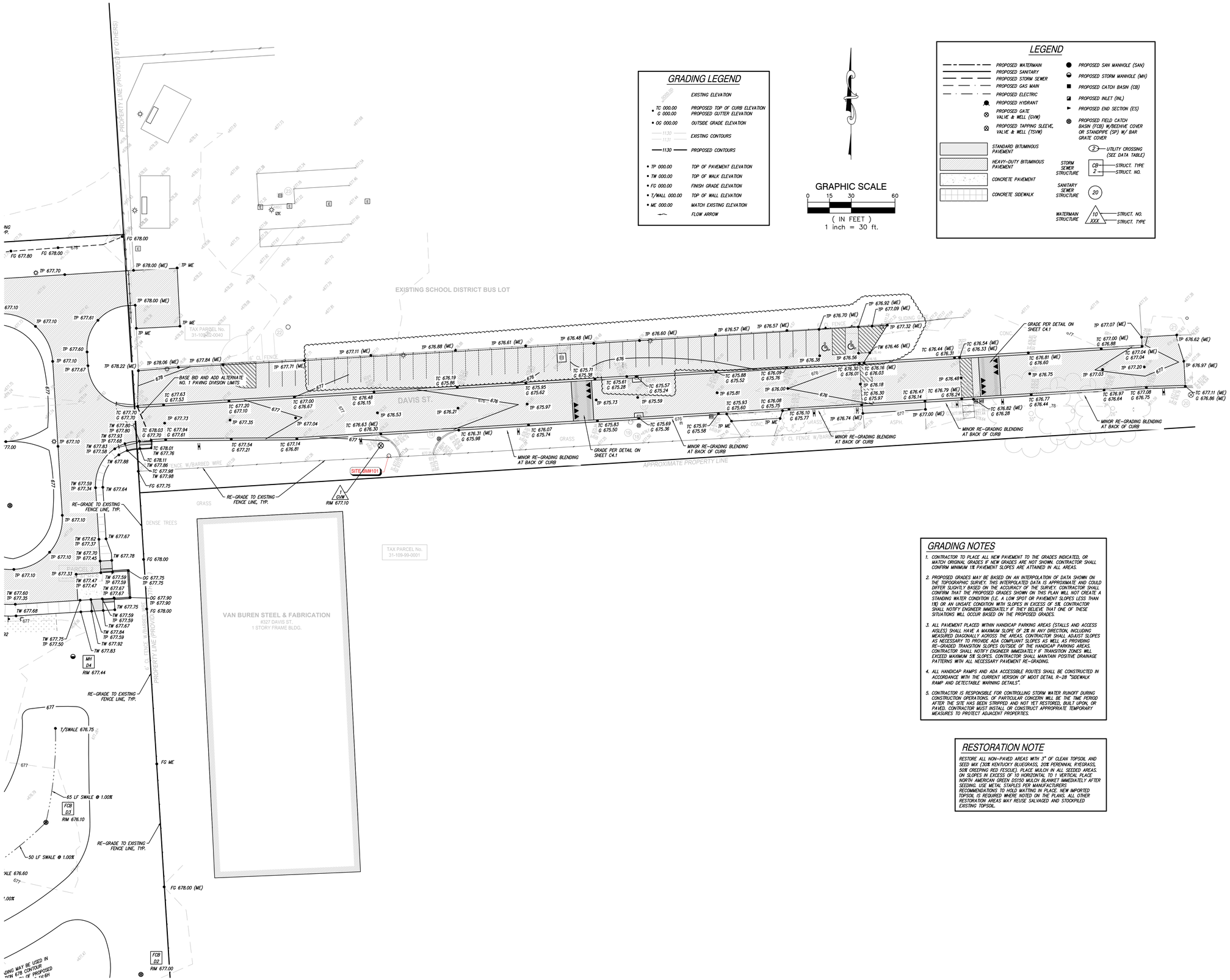
IDS Drawing Title

Paving Details and Notes

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C4.4



GRADING LEGEND

	EXISTING ELEVATION
• TC 000.00 G 000.00	PROPOSED TOP OF CURB ELEVATION PROPOSED GUTTER ELEVATION
• OG 000.00	OUTSIDE GRADE ELEVATION
1130	EXISTING CONTOURS
1130	PROPOSED CONTOURS
• TP 000.00	TOP OF PAVEMENT ELEVATION
• TW 000.00	TOP OF WALK ELEVATION
• FG 000.00	FINISH GRADE ELEVATION
• T/WALL 000.00	TOP OF WALL ELEVATION
• ME 000.00	MATCH EXISTING ELEVATION
	FLOW ARROW

GRAPHIC SCALE

0 15 30 60

(IN FEET)
1 inch = 30 ft.

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- (2) UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB / 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 / XXX — STRUCT. NO. / STRUCT. TYPE

GRADING NOTES

1. CONTRACTOR TO PLACE ALL NEW PAVEMENT TO THE GRADES INDICATED, OR MATCH ORIGINAL GRADES IF NEW GRADES ARE NOT SHOWN. CONTRACTOR SHALL CONFIRM MINIMUM 1% PAVEMENT SLOPES ARE ATTAINED IN ALL AREAS.
2. PROPOSED GRADES MAY BE BASED ON AN INTERPOLATION OF DATA SHOWN ON THE TOPOGRAPHIC SURVEY. THIS INTERPOLATED DATA IS APPROXIMATE AND COULD DIFFER SLIGHTLY BASED ON THE ACCURACY OF THE SURVEY. CONTRACTOR SHALL CONFIRM THAT THE PROPOSED GRADES SHOWN ON THIS PLAN WILL NOT CREATE A STANDING WATER CONDITION (I.E. A LOW SPOT OR PAVEMENT SLOPES LESS THAN 1%) OR AN UNSAFE CONDITION WITH SLOPES IN EXCESS OF 5%. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF THEY BELIEVE THAT ONE OF THESE SITUATIONS WILL OCCUR BASED ON THE PROPOSED GRADES.
3. ALL PAVEMENT PLACED WITHIN HANDICAP PARKING AREAS (STALLS AND ACCESS AISLES) SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION, INCLUDING MEASURED DIAGONALLY ACROSS THE AREAS. CONTRACTOR SHALL ADJUST SLOPES AS NECESSARY TO PROVIDE ADA COMPLIANT SLOPES AS WELL AS PROVIDING RE-GRADED TRANSITION SLOPES OUTSIDE OF THE HANDICAP PARKING AREAS. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF TRANSITION ZONES WILL EXCEED MAXIMUM 5% SLOPES. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE PATTERNS WITH ALL NECESSARY PAVEMENT RE-GRADING.
4. ALL HANDICAP RAMPS AND ADA ACCESSIBLE ROUTES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT VERSION OF MDOT DETAIL R-28 "SIDEWALK RAMP AND DETECTABLE WARNING DETAILS".
5. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER RUNOFF DURING CONSTRUCTION OPERATIONS. OF PARTICULAR CONCERN WILL BE THE TIME PERIOD AFTER THE SITE HAS BEEN STRIPPED AND NOT YET RESTORED, BUILT UPON, OR PAVED. CONTRACTOR MUST INSTALL OR CONSTRUCT APPROPRIATE TEMPORARY MEASURES TO PROTECT ADJACENT PROPERTIES.

RESTORATION NOTE

RESTORE ALL NON-PAVED AREAS WITH 3" OF CLEAN TOPSOIL AND SEED MIX (30% KENTUCKY BLUEGRASS, 20% PERENNIAL RYEGRASS, 50% CREEPING RED FESCUE). PLACE MULCH IN ALL SEEDED AREAS. ON SLOPES IN EXCESS OF 10 HORIZONTAL TO 1 VERTICAL PLACE NORTH AMERICAN GREEN DS150 MULCH BLANKET IMMEDIATELY AFTER SEEDING. USE METAL STAPLES PER MANUFACTURERS RECOMMENDATIONS TO HOLD MATTING IN PLACE. NEW IMPORTED TOPSOIL IS REQUIRED WHERE NOTED ON THE PLANS. ALL OTHER RESTORATION AREAS MAY REUSE SALVAGED AND STOCKPILED EXISTING TOPSOIL.

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Project Architect / Engineer: J. Ensley
Drawn By: C. Yang
Q.M. Review: T. Sovel
Approved: T. Sovel
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EGLE Water Supply Permit	12-07-2020
Bulletin No. 1 Revised	12-08-2020
Bulletin No. 6	06-16-2021

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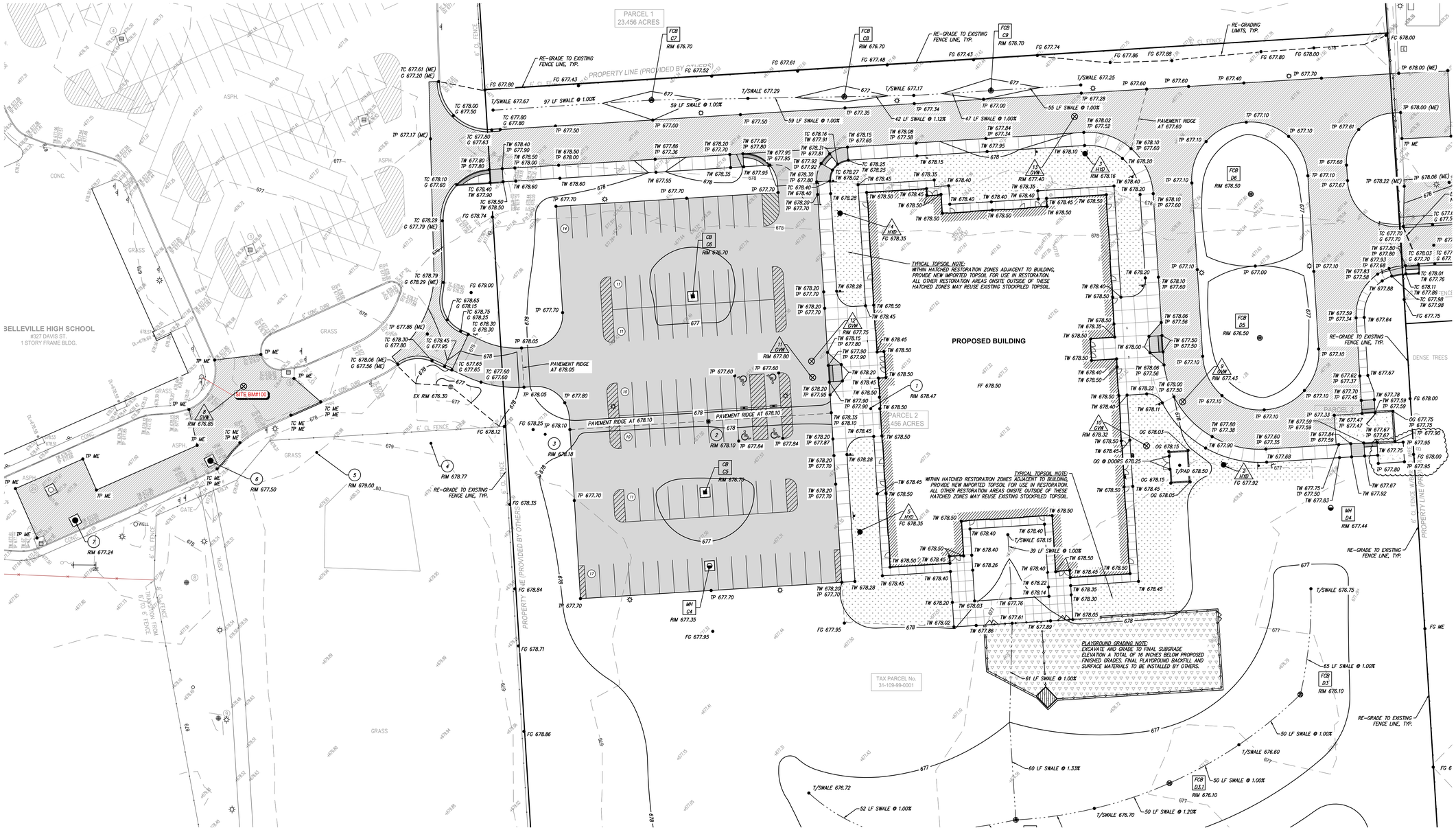
IDS Drawing Title

Grading Plan
Area "A"

IDS Project Number: **20111-1000**
SDA Project No. NP20062

Drawing Number: **C5.1**



GRADING LEGEND

000.00	EXISTING ELEVATION
TC 000.00 / G 000.00	PROPOSED TOP OF CURB ELEVATION / PROPOSED GUTTER ELEVATION
OG 000.00	OUTSIDE GRADE ELEVATION
1130 / 1131	EXISTING CONTOURS
1130	PROPOSED CONTOURS
TP 000.00	TOP OF PAVEMENT ELEVATION
TW 000.00	TOP OF WALK ELEVATION
FG 000.00	FINISH GRADE ELEVATION
T/WALL 000.00	TOP OF WALL ELEVATION
ME 000.00	MATCH EXISTING ELEVATION
	FLOW ARROW

REFER TO SHEET C5.1 FOR ADDITIONAL GRADING NOTES

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- 2 — UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB — STRUCT. TYPE; 2 — STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 / XXX — STRUCT. NO. / STRUCT. TYPE

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Bulletin No. 6	06-16-2021
Bulletin No. 8	09-28-2021

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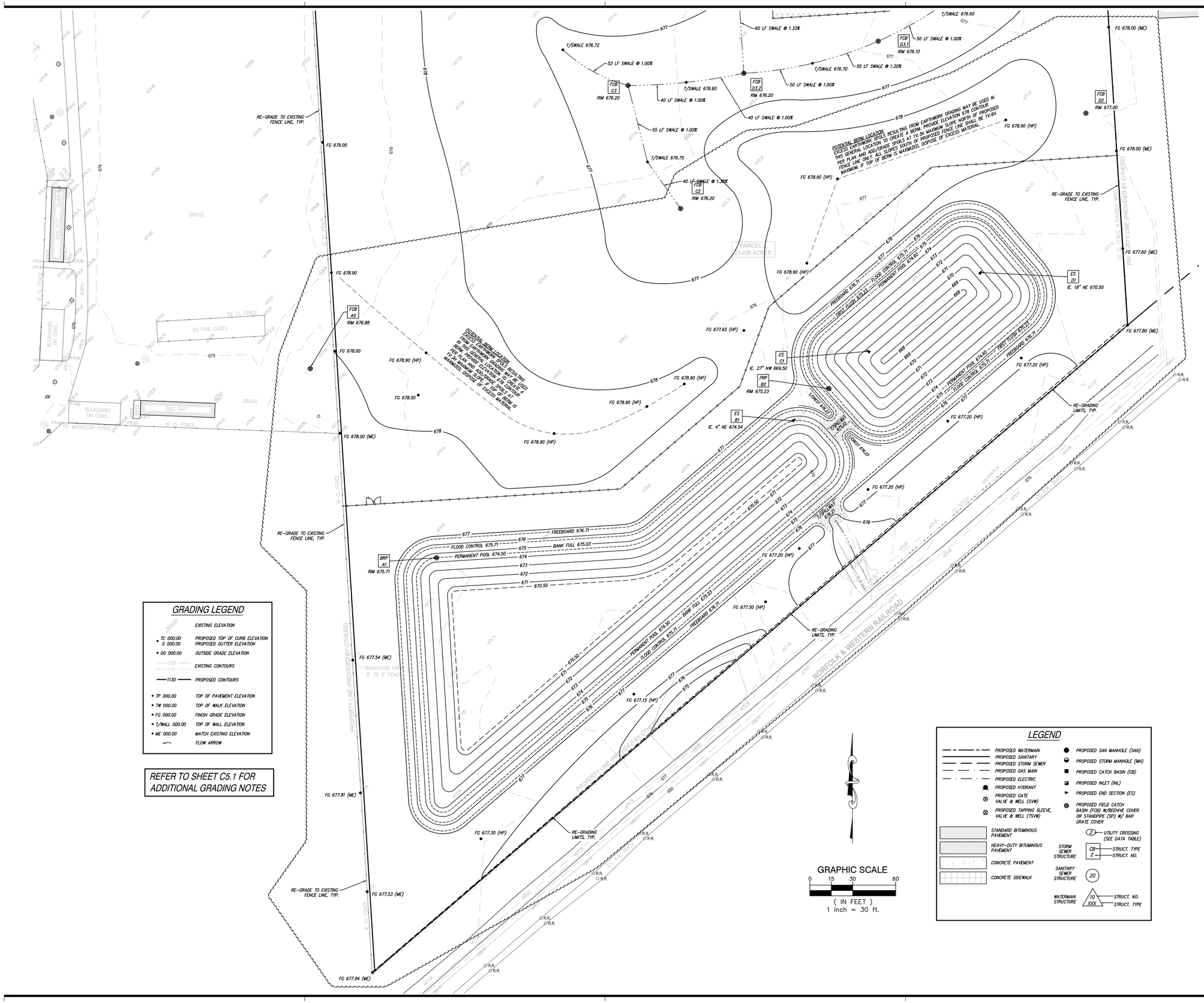
IDS Drawing Title

Grading Plan
Area "B"

IDS Project Number: 20111-1000
SDA Project No. NP20062

Drawing Number: C5.2



GRADING LEGEND

1130	EXISTING ELEVATION
TC 000.00 / G 000.00	PROPOSED TOP OF CURB ELEVATION / PROPOSED GUTTER ELEVATION
OG 000.00	OUTSIDE GRADE ELEVATION
1130 / 1131	EXISTING CONTOURS
1130	PROPOSED CONTOURS
TP 000.00	TOP OF PAVEMENT ELEVATION
TW 000.00	TOP OF WALK ELEVATION
FG 000.00	FINISH GRADE ELEVATION
T/WALL 000.00	TOP OF WALL ELEVATION
ME 000.00	MATCH EXISTING ELEVATION
	FLOW ARROW

REFER TO SHEET C5.1 FOR ADDITIONAL GRADING NOTES

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- 2 — UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB — STRUCT. TYPE; 2 — STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 / XXX — STRUCT. NO. / STRUCT. TYPE

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EGLE Water Supply Permit	12-07-2020
Bulletin No. 1 Revised	12-08-2020

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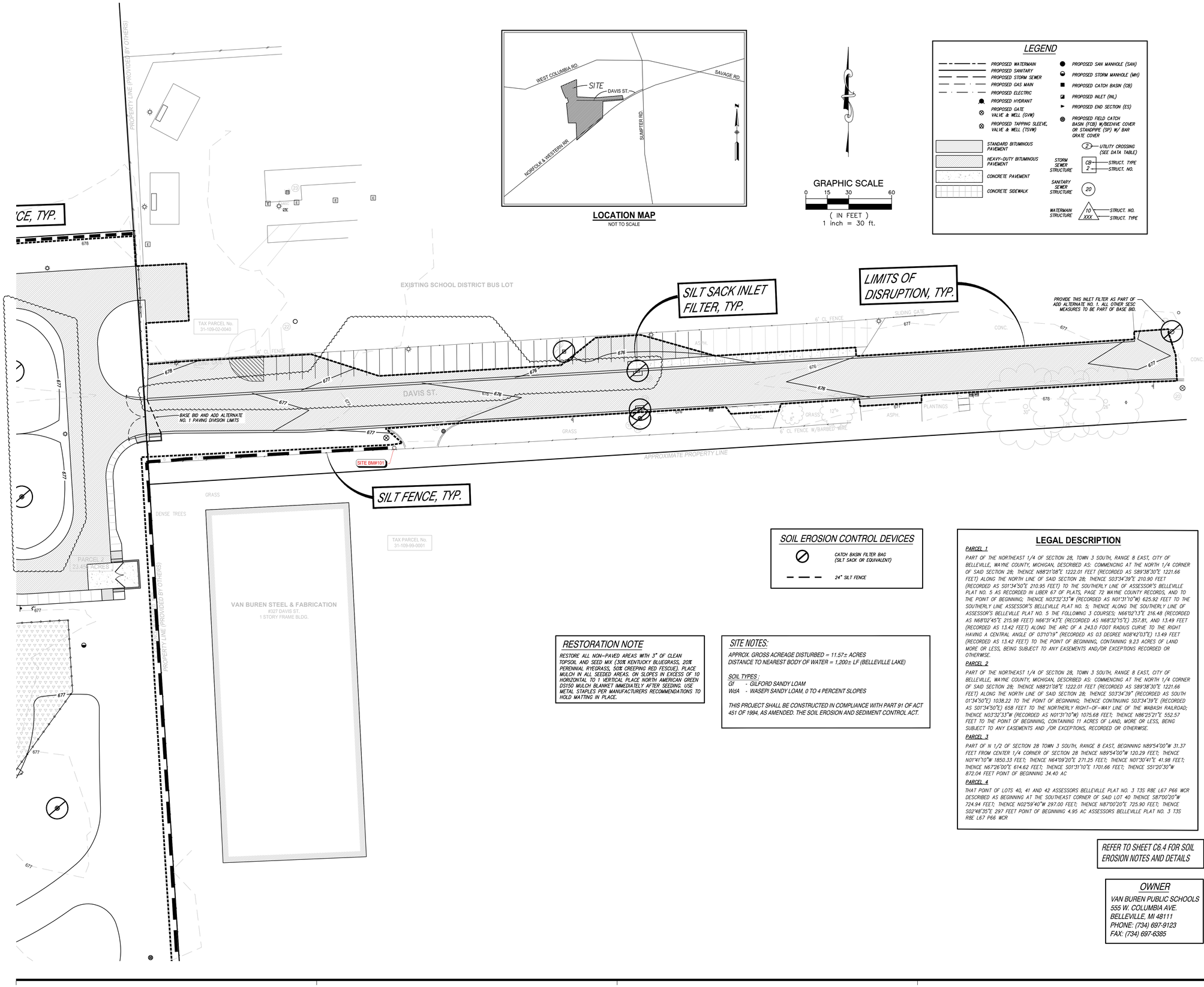
IDS Drawing Title

Grading Plan
Area "C"

IDS Project Number: 20111-1000
SDA Project No. NP20062

Drawing Number: C5.3



LOCATION MAP
NOT TO SCALE

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB / 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 / XXX — STRUCT. NO. / STRUCT. TYPE

SOIL EROSION CONTROL DEVICES

- CATCH BASIN FILTER BAG (SILT SACK OR EQUIVALENT)
- 24" SILT FENCE

RESTORATION NOTE

RESTORE ALL NON-PAVED AREAS WITH 3" OF CLEAN TOPSOIL AND SEED MIX (30% KENTUCKY BLUEGRASS, 20% PERENNIAL RYEGRASS, 50% CREEPING RED FESCUE). PLACE MULCH IN ALL SEEDED AREAS. ON SLOPES IN EXCESS OF 10 HORIZONTAL TO 1 VERTICAL PLACE NORTH AMERICAN GREEN DS150 MULCH BLANKET IMMEDIATELY AFTER SEEDING. USE METAL STAPLES PER MANUFACTURERS RECOMMENDATIONS TO HOLD MATTING IN PLACE.

SITE NOTES:

APPROX. GROSS ACREAGE DISTURBED = 11.57± ACRES
DISTANCE TO NEAREST BODY OF WATER = 1,200± LF (BELLEVILLE LAKE)

SOIL TYPES :
GfA - GILFORD SANDY LOAM
WoA - WASEPI SANDY LOAM, 0 TO 4 PERCENT SLOPES

THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED. THE SOIL EROSION AND SEDIMENT CONTROL ACT.

LEGAL DESCRIPTION

PARCEL 1

PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 SOUTH, RANGE 8 EAST, CITY OF BELLEVILLE, WAYNE COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 28; THENCE N88°21'08"E 1222.01 FEET (RECORDED AS S89°38'30"E 1221.66 FEET) ALONG THE NORTH LINE OF SAID SECTION 28; THENCE S03°34'39"E 210.90 FEET (RECORDED AS S01°34'50"E 210.95 FEET) TO THE SOUTHERLY LINE OF ASSESSOR'S BELLEVILLE PLAT NO. 5 AS RECORDED IN LIBER 67 OF PLATS, PAGE 72 WAYNE COUNTY RECORDS, AND TO THE POINT OF BEGINNING; THENCE N03°32'33"W (RECORDED AS N01°31'10"W) 625.92 FEET TO THE SOUTHERLY LINE ASSESSOR'S BELLEVILLE PLAT NO. 5; THENCE ALONG THE SOUTHERLY LINE OF ASSESSOR'S BELLEVILLE PLAT NO. 5 THE FOLLOWING 3 COURSES; N66°02'13"E 216.48 (RECORDED AS N68°02'45"E 215.98 FEET) N66°31'43"E (RECORDED AS N68°32'15"E) 357.81, AND 13.49 FEET (RECORDED AS 13.42 FEET) ALONG THE ARC OF A 243.0 FOOT RADIUS CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 03°10'19" (RECORDED AS 03 DEGREE N08°42'03"E) 13.49 FEET (RECORDED AS 13.42 FEET) TO THE POINT OF BEGINNING, CONTAINING 9.23 ACRES OF LAND MORE OR LESS, BEING SUBJECT TO ANY EASEMENTS AND/OR EXCEPTIONS RECORDED OR OTHERWISE.

PARCEL 2

PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 SOUTH, RANGE 8 EAST, CITY OF BELLEVILLE, WAYNE COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 28; THENCE N88°21'08"E 1222.01 FEET (RECORDED AS S89°38'30"E 1221.66 FEET) ALONG THE NORTH LINE OF SAID SECTION 28; THENCE S03°34'39" (RECORDED AS SOUTH 01°34'50"E) 1038.22 TO THE POINT OF BEGINNING; THENCE CONTINUING S03°34'39"E (RECORDED AS S01°34'50"E) 658 FEET TO THE NORTHERLY RIGHT-OF-WAY LINE OF THE WABASH RAILROAD; THENCE N03°32'33"W (RECORDED AS N01°31'10"W) 1075.68 FEET; THENCE N86°25'21"E 552.57 FEET TO THE POINT OF BEGINNING, CONTAINING 11 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO ANY EASEMENTS AND /OR EXCEPTIONS, RECORDED OR OTHERWISE.

PARCEL 3

PART OF N 1/2 OF SECTION 28 TOWN 3 SOUTH, RANGE 8 EAST, BEGINNING N89°54'00"W 31.37 FEET FROM CENTER 1/4 CORNER OF SECTION 28 THENCE N89°54'00"W 120.29 FEET; THENCE N01°41'10"W 1850.33 FEET; THENCE N64°09'20"E 271.25 FEET; THENCE N01°30'41"E 41.98 FEET; THENCE N67°26'00"E 614.62 FEET; THENCE S01°31'10"E 1701.66 FEET; THENCE S51°20'30"W 872.04 FEET POINT OF BEGINNING 34.40 AC

PARCEL 4

THAT POINT OF LOTS 40, 41 AND 42 ASSESSORS BELLEVILLE PLAT NO. 3 T3S R8E L67 P66 WCR DESCRIBED AS BEGINNING AT THE SOUTHEAST CORNER OF SAID LOT 40 THENCE S87°00'20"W 724.94 FEET; THENCE N02°59'40"W 297.00 FEET; THENCE N87°00'20"E 725.90 FEET; THENCE S02°48'35"E 297 FEET POINT OF BEGINNING 4.95 AC ASSESSORS BELLEVILLE PLAT NO. 3 T3S R8E L67 P66 WCR

REFER TO SHEET C6.4 FOR SOIL EROSION NOTES AND DETAILS

OWNER

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Van Buren Public Schools

The Early Childhood Development Center

Davis St.
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Project Designer
J. Ensley
Project Architect / Engineer
J. Ensley
Drawn By
C. Yang
Q.M. Review
T. Sovel
Approved
T. Sovel
Drawing Scale
As Noted

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Bid Package 1	08-14-2020
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City Engineering Revisions	12-07-2020
EGLE Water Supply Permit	12-07-2020
Bulletin No. 1 Revised	12-08-2020

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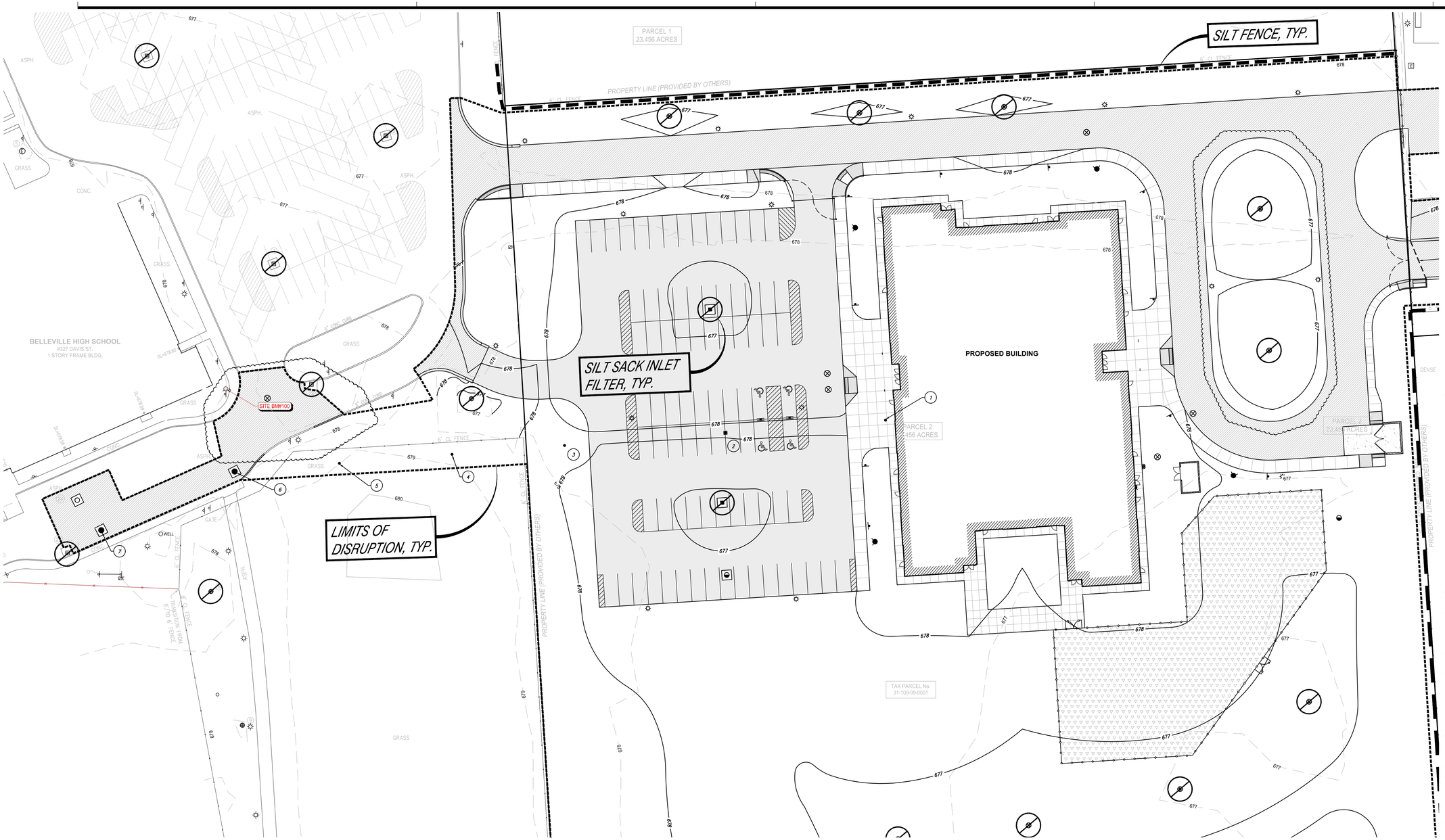
IDS Drawing Title

Soil Erosion and Sedimentation Control Plan Area "A"

IDS Project Number
20111-1000
SDA Project No. NP20062

Drawing Number
C6.1



SOIL EROSION CONTROL DEVICES

- CATCH BASIN FILTER BAG (SILT SACK OR EQUIVALENT)
- 24" SILT FENCE

REFER TO SHEETS C6.1 AND C6.4 FOR SOIL EROSION NOTES AND DETAILS

GRAPHIC SCALE

0 15 30 60

(IN FEET)

1 inch = 30 ft.

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
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- PROPOSED GATE VALVE & WELL (GVW)
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- PROPOSED SAN MANHOLE (SAN)
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- PROPOSED FIELD CATCH BASIN (FCB) W/BEEHIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- STANDARD BITUMINOUS PAVEMENT
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- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: 20
- WATERMAIN STRUCTURE: 10 XXX — STRUCT. NO. / STRUCT. TYPE

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Project Designer: J. Ensley
Project Architect / Engineer: J. Ensley
Drawn By: C. Yang
Q.M. Review: T. Sovel
Approved: T. Sovel
Drawing Scale: As Noted

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Bulletin No. 1 Revised	12-08-2020

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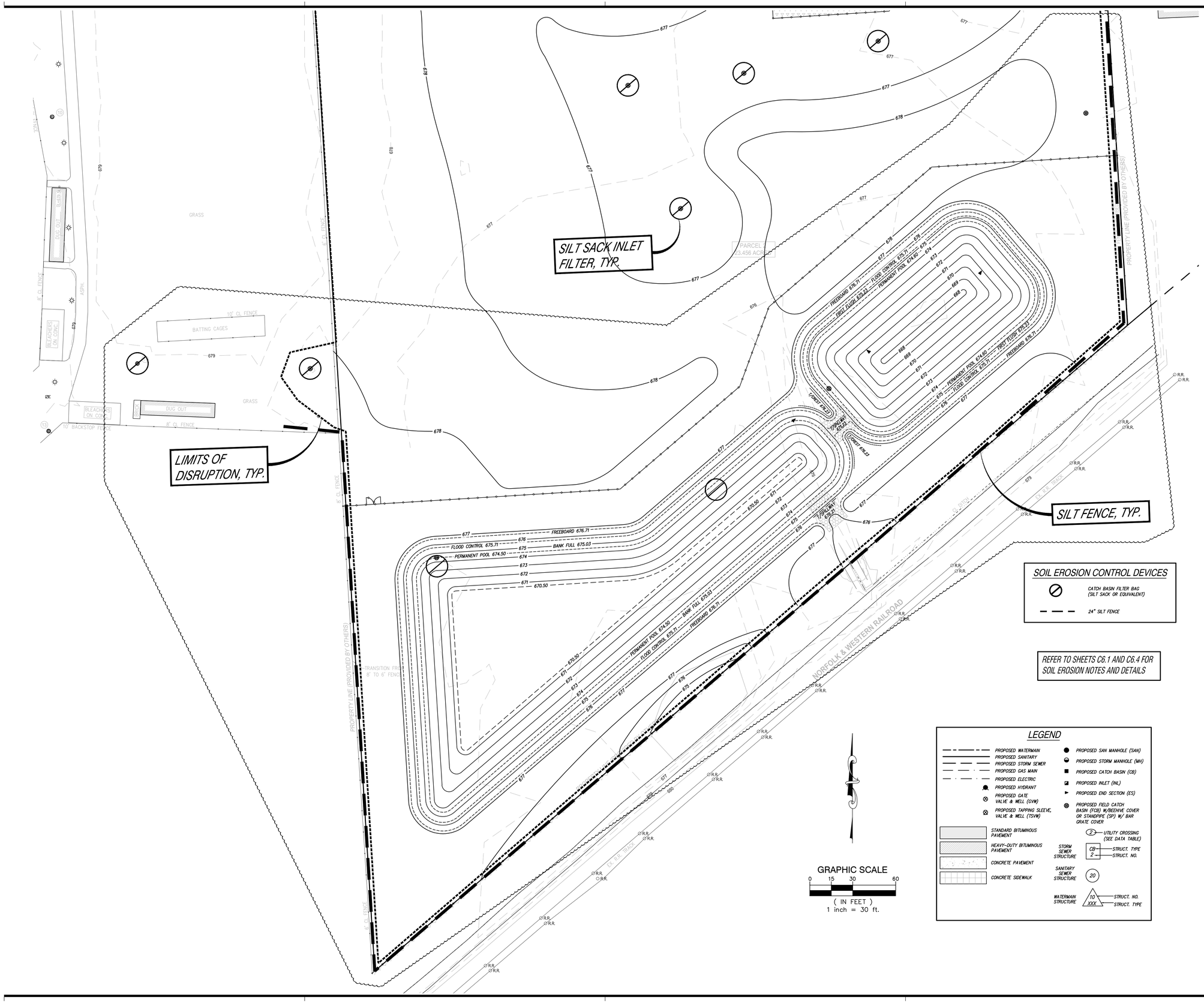
IDS Drawing Title

Soil Erosion and Sedimentation Control Plan
Area "B"

IDS Project Number: 20111-1000
SDA Project No. NP20062

Drawing Number: C6.2



SOIL EROSION CONTROL DEVICES

- CATCH BASIN FILTER BAG (SILT SACK OR EQUIVALENT)
- 24" SILT FENCE

REFER TO SHEETS C6.1 AND C6.4 FOR SOIL EROSION NOTES AND DETAILS

LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY
- PROPOSED STORM SEWER
- PROPOSED GAS MAIN
- PROPOSED ELECTRIC
- PROPOSED HYDRANT
- PROPOSED GATE VALVE & WELL (GVW)
- PROPOSED TAPPING SLEEVE, VALVE & WELL (TSVW)
- PROPOSED SAN MANHOLE (SAN)
- PROPOSED STORM MANHOLE (MH)
- PROPOSED CATCH BASIN (CB)
- PROPOSED INLET (INL)
- PROPOSED END SECTION (ES)
- PROPOSED FIELD CATCH BASIN (FCB) W/RECEIVE COVER OR STANDPIPE (SP) W/ BAR GRATE COVER
- STANDARD BITUMINOUS PAVEMENT
- HEAVY-DUTY BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- (2) UTILITY CROSSING (SEE DATA TABLE)
- STORM SEWER STRUCTURE: CB / 2 — STRUCT. TYPE / STRUCT. NO.
- SANITARY SEWER STRUCTURE: (20)
- WATERMAIN STRUCTURE: 10 / XXX — STRUCT. NO. / STRUCT. TYPE

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Project Architect / Engineer	J. Ensley
Drawn By	C. Yang
Q.M. Review	T. Sovel
Approved	T. Sovel
Drawing Scale	As Noted

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IDS Drawing Title

Soil Erosion and Sedimentation Control Plan Area "C"

IDS Project Number: **20111-1000**
SDA Project No. NP20062

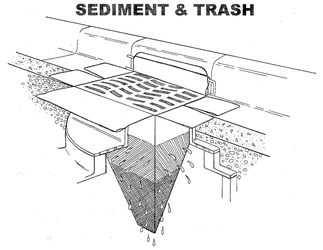
Drawing Number: **C6.3**

Price and Company, Inc.

SILTSACK®

Trademark owned by ACF Environmental

PROTECT CATCH BASINS FROM SEDIMENT & TRASH



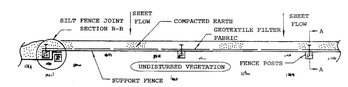
SILTSACK traps sand, debris and most silt particles before they reach the sump or pipes. Costly basin and pipe system cleaning are reduced. With **SILTSACK**, maintenance is easy and site flooding is just a memory. Best of all, **SILTSACK** can be reused!

- EASY TO INSTALL - EASY TO MAINTAIN
- ECONOMICAL
- FABRICATED TO FIT ANY SIZE OR SHAPE
- PERMEABILITY OF 200 GPM/SF [Hi-Flow style]
- REPLACES ALL ROCK OR GEOTEXTILES
- REUSABLE

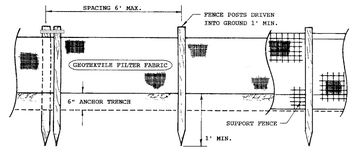
SILTSACK WORKS!

Trademark of Price and Company, Inc.

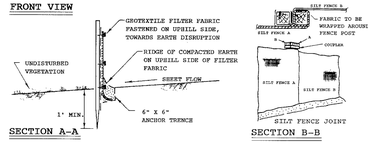
SILT FENCE



PLAN VIEW



FRONT VIEW



SECTION A-A

SECTION B-B

SOIL EROSION/SEDIMENTATION CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY OF BELLEVILLE.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR TO DETERMINE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL DEVICES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENT FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATER WAYS. WATERWAYS INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. EROSION AND SEDIMENT CONTROL DEVICES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CONSTRUCTION; SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
5. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES AS REQUIRED AND AS DIRECTED ON THESE PLANS. HE SHALL REMOVE TEMPORARY DEVICES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGES HAVE BEEN ACCOMPLISHED AND APPROVED BY THE CITY OF BELLEVILLE.
6. DEBRIS FROM PROJECT WILL BE LEFT ON THE SITE BY DELIVERY OR CONSTRUCTION VEHICLES THROUGH THE USE OF CLEAN STONE EXITS. SHOULD THE STONE BECOME LESS EFFECTIVE IT WILL BE REPLACED. ALL CONSTRUCTION TRAFFIC WILL USE THE CLEAN STONE EXIT.
7. DUST CONTROL WILL BE EXERCISED AT ALL TIMES WITHIN THE PROJECT BY THE CONTRACTORS. SPRINKLING TANK TRUCKS WILL BE AVAILABLE AT ALL TIMES TO BE USED ON HAUL ROUTES OR OTHER PLACES WHERE DUST BECOMES A PROBLEM.
8. IMMEDIATELY AFTER SEEDING, MULCH ALL SEEDED AREAS WITH UNWEATHERED SMALL GRAIN STRAW OR HAY. SPREAD UNIFORMLY AT A RATE OF 1 1/2 TO 2 TONS PER ACRE OR 0.10 POUNDS PER SQUARE FEET. ANCHOR MULCH WITH DISC TYPE MULCH ANCHORING TOOL.
9. ALL MUD, DIRT, AND DEBRIS TRACKED ONTO EXISTING ROADS FROM THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR OR BUILDER. ALL MUD, DIRT, AND DEBRIS TRACKED OR SPILLED ONTO PAVED SURFACES WITHIN THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
10. PERMANENT SOIL EROSION CONTROL DEVICES FOR ALL SLOPES, CHANNELS, DITCHES OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OR FINAL EARTH CHANGES HAVE BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE ACTIVITY CEASES TEMPORARY SOIL EROSION CONTROL DEVICES SHALL BE IMPLEMENTED WITHIN 30 CALENDAR DAYS. ALL TEMPORARY SOIL EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION DEVICES ARE IMPLEMENTED AND/OR ESTABLISHED. ALL PERMANENT SOIL EROSION CONTROL DEVICES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF INSURANCE IS ISSUED.
11. ALL CONTRACTORS ARE TO KEEP EXCAVATED MATERIAL ON SITE. PARTICULAR CARE SHOULD BE TAKEN WHEN WORKING ALONG THE PERIMETER OF THE SITE. IN NO EVENT SHALL THE WORK AREA EXTEND BEYOND THE LIMITS INDICATED ON THE PLANS.
12. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY THE CONTRACTOR.

SOIL EROSION/SEDIMENTATION CONTROL CONSTRUCTION SEQUENCE

1. INSTALL SILT FENCE AROUND DEFINED PERIMETER AND INLET FILTERS IN EXISTING STRUCTURES AS SHOWN.
2. CLEAR, GRUB AND STRIP TOPSOIL IN AREAS OF EARTH DISRUPTION. DEMOLISH EXISTING PAVEMENT.
3. COMPLETE LAND BALANCING OPERATIONS.
4. INSTALL UNDERGROUND UTILITIES AND PLACE NEW INLET FILTERS WHERE INDICATED.
5. INSTALL PROPOSED BUILDING.
6. PERFORM FINE GRADING, PAVING OPERATIONS, LANDSCAPING.
7. EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL THE CITY OF BELLEVILLE GRANTS ITS APPROVAL. INLET FILTERS SHALL BE PERIODICALLY INSPECTED AND CLEANED/REPLACED AS NECESSARY.

ALL EROSION CONTROL MEASURES SHALL BE INSTALLED APPROXIMATELY ACCORDING TO THE FOLLOWING SEQUENCE OF CONSTRUCTION.

PROJECT COMMENCEMENT ON OR ABOUT SEPTEMBER 2020.

SCHEDULE

A.	INSTALL SILT FENCE AND INLET FILTERS AS SHOWN ON PLANS.	1-2 DAYS
B.	STRIP AND STOCKPILE TOPSOIL, DEMOLISH PAVEMENT AND ROUGH GRADE SITE.	3-4 WEEKS
C.	INSTALL UNDERGROUND UTILITIES.	3-4 WEEKS
D.	CONSTRUCT PROPOSED BUILDING.	48-56 WEEKS
E.	FINE GRADE SITE, PAVE, INSTALL LANDSCAPING AND ESTABLISH VEGETATION.	3-4 WEEKS
F.	CLEAN PAVEMENTS, WALKS, CULVERTS, AND WATERCOURSES OF ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH REMOVING ALL TEMPORARY DEVICES.	1 WEEK

PROJECT COMPLETION ON OR ABOUT DECEMBER 2021.

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IDS Drawing Title

Soil Erosion and Sedimentation Control Details and Notes

IDS Project Number

20111-1000

SDA Project No. NP20062

Drawing Number

C6.4

CITY OF BELLEVILLE STANDARD GENERAL NOTES

1. All workmanship and materials shall be in accordance with the current standards and specifications of the City of Belleville.

2. The contractor and his subcontractors shall attend a pre–construction meeting at a time and place arranged by the engineer in which various utility companies and governmental agency representatives will be present.

3. After a pre–construction meeting is held, the contractor shall notify Hennessey Engineers, Inc. a minimum of 3 working days prior to the start of construction.

4. Contractor shall notify Miss Dig for existing utility stake out 3 working days in advance of construction. The project will be billed for excessive stakeouts.

5. Locations and elevations of existing underground utilities as shown on the plans are approximate. No guarantee is either expressed or implied as to the completeness or accuracy thereof. The contractor shall be exclusively responsible for determining and verifying the location, depth, and elevation of existing utilities, and proposed utilities crossing the construction area prior to start of construction. Contractor shall notify engineer if any conflicts are apparent or if locations and depth differ significantly from the plans.

6. All elevations refer to current N.G.V.D. datum.

7. All properties or facilities in the surrounding areas, public or private, destroyed or otherwise damaged by the contractors operations shall be replaced or repaired to the satisfaction of the authority having jurisdiction of the property or facility by the contractor at his own expense.

8. Contractor shall provide and maintain all necessary barricades and traffic control devices required by the current standards and specifications of the City of Belleville, other agencies having jurisdiction, and the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

9. All required soil erosion and sedimentation control measures must be in place prior to starting construction, including stripping and grubbing.

10. All trenches under or within three feet of existing or proposed pavement, curb, sidewalks, and driveways shall be backfilled with 21A crushed limestone (Trench B) and compacted in one foot layers to a minimum 95 percent maximum unit weight.

11. All trenches within or parallel and adjacent to right–of–way, except where 21A crushed limestone (Trench B) backfill is required, shall be backfilled with suitable excavated material (excluding blue clay) compacted in one foot layers to a minimum of 90 percent maximum unit weight. This trench shall be designated Trench "A".

12. Four inches of compacted approved bedding shall be placed under all utilities and to one foot above the top of the pipe.

13. A recording detector tape, approved by the engineer, shall be installed two feet above the top of all non–metal sewer and water lines.

14. All public improvements and private improvements shall be field staked under the supervision of a professional engineer or land surveyor licensed to practice in the State of Michigan. If Hennessey Engineers, Inc. is not performing the field staking, a copy of the surveying cut sheet must be sent to Hennessey Engineers, Inc., one (1) working day prior to any construction starting.

15. All work within Wayne County and State of Michigan right–of–way shall be in accordance with their specifications. A copy of the required permit(s) must be on file with Hennessey Engineers and the City of Belleville prior to any construction starting.

16. All disturbed lawn areas shall be restored with 3 inches of topsoil and Class "A" sod. The Contractor will be responsible for watering and maintaining the sod until it is firmly knitted in place and in a vigorous growing condition. Areas designated by the City Engineer as non–lawn areas, but grass areas, shall have placed 3 inches of topsoil, a chemical fertilizer, a Michigan Department of Environmental Quality roadside mixture of seed sowed, and a mulch applied in accordance with City of Woodhaven Standard Specifications.

17. For isolated road cuts, all trenches shall be backfilled with "K–Krete" or an approved equal flowable fill. This shall be designated as Trench "C".

CITY OF BELLEVILLE STANDARD WATERMAIN NOTES

1. All construction shall conform to current Belleville Detailed Specifications for watermain and any other agency having jurisdiction of the construction area.

2. Slip–on joints may be used except at tees, bends, and hydrants, where mechanical joints will be used.

3. All watermain shall be placed on approved bedding as shown on the City Belleville Standard Watermain Details.

4. All watermains shall be installed a minimum of 5.5 feet below proposed finished grade. Seven (7) foot minimums when in County Right–of–Way. When a watermain must dip to pass under a storm sewer or sanitary sewer, the sections which are deeper than normal shall have a minimum of 18" clearance between utilities and be in accordance with the standard detail.

5. No pipe shall be deflected more than 3 degrees. Where deflections greater than 3 degrees are required, bends, vertical or horizontal, will be required in accordance with the details.

6. A thrust block is required on the opposite side of each hydrant, tee, cap and bend.

7. Connections to existing watermains shall not be made until after hydrostatic/bacteriological tests have been successfully completed and reviewed by the Engineer.

8. The watermain shall be pressure tested at 150 psi for 2 hours with an allowable leakage of 1 gallon per inch diameter per mile of pipe in the 2 hour period. Test sections shall not exceed 1,000 feet. Testing against valves is not allowed.

9. Fire hydrants shall be East Jordan Iron Works Water Master 5BR250 equipped with 2– 4.5" pumper nozzles in commercial, industrial, and residential areas. Opening shall be in a counter–clockwise direction. Threads shall be Detroit Standard Threads with 1–1/8 pentagonal nut.

10. All hydrants shall be properly orientated and approved by the Department of Public Services prior to the pressure test.

11. All hydrants not in service shall be covered with black plastic until such time as they are put in service or removed.

12. All gate valves shall be left hand open E.J.I.W. Flow Master Resilient Seated.

13. Water gatewells shall not be located in driveways, sidewalks or streets.

14. Gate valves and curb stops shall only be operated by City of Belleville Water/Sewer Department personnel except in an emergency.

15. Contractor shall compact all trenches and excavated areas in one–foot lifts by vibratory means during the backfilling operations to the required percent per the City of Belleville Standards.

16. The City of Detroit Water and Sewer Department, the City of Belleville, and Hennessey Engineers, Inc. shall be notified at least 72 hours (three (3) working days) prior to any watermain construction.

17. All saddles for water services shall be bronze with double stainless steel straps.

18. For isolated road cuts, all trenches shall be backfilled with "K–Krete" or an approved equal flowable fill. This shall be designated as Trench "C".

STANDARD STORM SEWER NOTES

1. All construction shall conform to current City of Belleville Standard Specifications for Storm Sewer and any other agency having jurisdiction of the construction area.

2. All road catchbasins and inlets shall have underdrains as shown on the City of Belleville Standard Storm Sewer Details. All parking lot catchbasins and inlets shall have underdrains as shown on the City of Belleville Standard Storm Sewer Details.

3. All storm sewer shall be placed on approved bedding as shown on the City of Belleville Standard Storm Sewer Details.

4. Contractor shall compact all trenches and excavated areas in one–foot lifts by vibratory means during backfilling operations to the required percent per the City of Belleville Standards.

5. For isolated road cuts, all trenches shall be backfilled with "K–Krete" or an approved equal flowable fill. This shall be designated as Trench "C".

STANDARD SANITARY SEWER NOTES

1. All construction shall conform to current City of Belleville Standard and General Specifications for Sanitary Sewer and other agencies having jurisdiction over the construction area.

2. All sanitary sewer wye openings shall contain factory installed premium joints.

3. No connection receiving stormwater, surface water, or groundwater shall be made to the public sanitary sewers or the building service lead.

4. Infiltration for any section of sewer between manholes shall not exceed 100 gallons per inch diameter, per mile, per 24 hours.

5. Each wye or end of building lead to be capped shall have a cap with the same type of material as the lead and shall have a solvent weld joint. Cleanouts shall have J.R. Smith # 4240U4 or approved equal covers with 24"x24" x6" thick concrete pad surround. See detail on sheet S.D.1.

6. Sanitary sewer leads shall be installed to a minimum of 1 foot past the right–of–way or easement line as shown on these plans. Risers are required where a sanitary sewer is over 10' in depth. Risers shall be installed to a depth of 10 feet.

7. A bulkhead shall be installed at each outlet to an existing system and shall not be removed until the new sewer system has been accepted by the City of Belleville.

8. All sewers shall be subjected to an air filtration, or exfiltration test or a combination of same prior to acceptance. All sewers over 24 inch diameter shall be subjected to infiltration tests. All sewers of 24 inch diameter of smaller, where the groundwater level above the top of the sewer is over 2 feet, shall be subjected to infiltration tests. All sewers of 24" diameter or less, where the groundwater level above the top of the sewer is 2 feet or less, shall be subjected to air tests or exfiltration tests.

9. All sewers shall be televised by the contractor, at no additional cost to the City of Belleville, with test results approved and the city provided a copy of the video tape of the sewer prior to placing the sewer in service.

10. Manhole casting shall be watertight, bolt down type with an approved external chimney seal.

11. Contractor shall notify Wayne County and the City of Belleville Water/Sewer Department at least 48 hours two (2) working days prior to start of construction.

12. Differential excavation around the existing manhole shall not exceed 6 feet.

13. All stubs shall have a water and air–tight bulkhead approved by the city.

14. Wherever existing manholes or sewer pipe are to be tapped, core manhole with a coring machine and install a rubber boot with stainless steel bands. Use Kor–N–Seal with Korband external contraction bands or approved equal.

15. All manhole steps shall be placed toward the property lines unless otherwise noted.

16. No footing drains or downspouts shall be connected to the building sewer.

17. Deflection Tests:

a. Deflection tests shall be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days.

b. No pipe shall exceed a deflection of 5%

c. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95% of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.

18. Contractor shall compact all trenches and excavated area in one–foot lifts by vibratory means during backfilling operations to the required percent per the City of Belleville Standards

19. For isolated road cuts, all trenches shall be backfilled with "K–Krete" or an approved equal flowable fill. This shall be designated as Trench "C".

STANDARD PAVING AND PAVEMENT REPLACEMENT NOTES

1. All construction shall conform to current City of Belleville Standards and General Specifications for Paving and any other agency having jurisdiction over the construction area.

2. Compaction of all pavement subbase shall be to a minimum of 95% maximum unit weight prior to placement of pavement. No paving shall take place prior to the successful testing of the compaction of the backfill and/or subbase.

3. All fill required to meet final subgrade elevations shall be select material approved by the City Engineer free from organic material or extraneous matter, and shall be placed in layers not exceeding 6 inches and compacted to a minimum of 95% of its maximum unit weight. The subgrade must be proof rolled prior to the placement on pavement base.

4. All radii at intersections are to be 25 feet unless otherwise noted.

5. The contractor shall submit, prior to the pre–construction meeting, a concrete and bituminous mix design from the supplier and a 21A crushed limestone sample for approval by the city engineer.

6. New pavement shall be as described in the plans and specifications.

7. All curb and gutter, new or replacement, shall be placed on a minimum of 4 inch 21A crushed limestone base. The base shall be placed one foot behind the back of curb.

8. Existing concrete pavement and curb sections shall be saw cut the full depth of the pavement prior to their removal.

9. Any excavation necessary to install replacement pavement at the proposed grades shall be performed by the contractor.

10. If the pavement is being replaced, the minimum thickness of replacement concrete allowed for roadways is 8 inches, and the minimum thickness of asphalt pavement for roadways is 5 inches.

11. If the drive approach or sidewalk located in the approach is being replaced, the minimum thickness of replacement concrete is 6 inches. No asphalt drive approaches are allowed. If the sidewalk is located outside the approach, the minimum thickness of concrete allowed is 4 inches. New driveway pavement shall be a minimum of 6" thick concrete with thickened edges unless otherwise noted.

12. All replacement pavement for roadways be placed on 21A crushed limestone per the City of Belleville standard specifications.

13. If an asphalt cap is required to match the existing pavement, the thickness of the existing asphalt shall be matched. This cap shall be placed on a minimum of 8 inches of replacement concrete.

14. Before placing the replacement pavement, the contractor shall install 1/2" diameter hook bolts with Philip Red Heads into the existing pavement. These bolts shall be install at 40 inches on center.

15. 21A crushed limestone, compacted in place to a minimum of 95 percent maximum unit weight shall be placed where additional base is required to meet proposed pavement grades.

16. The contractor shall remove unsatisfactory subgrade as determined by the engineer and replace the unsatisfactory subgrade with 21A crushed limestone compacted to a minimum of 95 percent maximum unit weight.

17. All joints in concrete pavement areas, including curb and gutter, shall be sealed with a hot–poured, elastic–type compound, approved by the city engineer.

18. Contractor shall protect all trees and shall be responsible for replacing any trees damaged by his operations.

19. Surface restoration shall include replacement of existing sod between the sidewalk and curb. Three inches of topsoil shall be placed prior to placing Class "A" sod. Contractor shall keep the sodded area continuously moist until a good growth is indicated.

20. It shall be the responsibility of the paving contractor to adjust the top of all existing structures (sewers, manholes, catchbasins, inlets, gatewells, etc., except hydrants) within the street right–of–way or within 10 feet adjacent to the street right–of–way to the final grade as required by the City of Belleville. All such adjustments will be incidental to the paving work.

21. The contractor shall install all required permanent pavement striping upon completion of the pavement replacement. This work shall be performed in accordance with the "Michigan Manual of Uniform Traffic Control Devices" (MMUTCD) and as directed by the Engineer.

22. All existing sidewalk that is cracked, uneven, and/or creates a trip hazard shall be removed and replaced as determined by the Engineer and Department of Public Services.

PROJECT NUMBER:

DATE: 03/29/05

SCALE: NTS

DESIGNED BY: ES

DRAWN BY: ES

CHECKED BY:

APPROVED BY:

REVISIONS

PER ENGINEER 03/03/04

PER CITY 09/08/06

ENGINEERING THE FUTURE.
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SOUTHGATE, MI 48195
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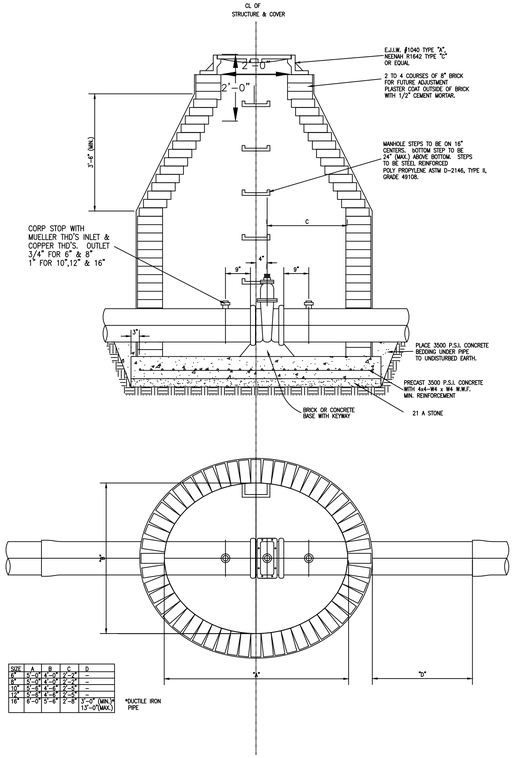
WWW.HENGINEERS.COM
HENNESSEY ENGINEERS, INC.

TITLE STANDARD NOTES
CITY OF BELLEVILLE
WAYNE COUNTY, MICHIGAN

SHEET C7.1

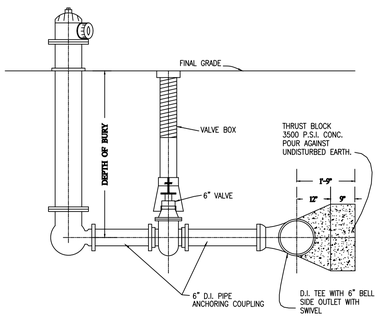


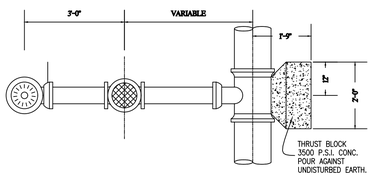
6" TO 16" BLOCK GATE VALVE AND WELL

(TO BE USED IN SPECIAL CIRCUMSTANCES APPROVED BY THE CITY)

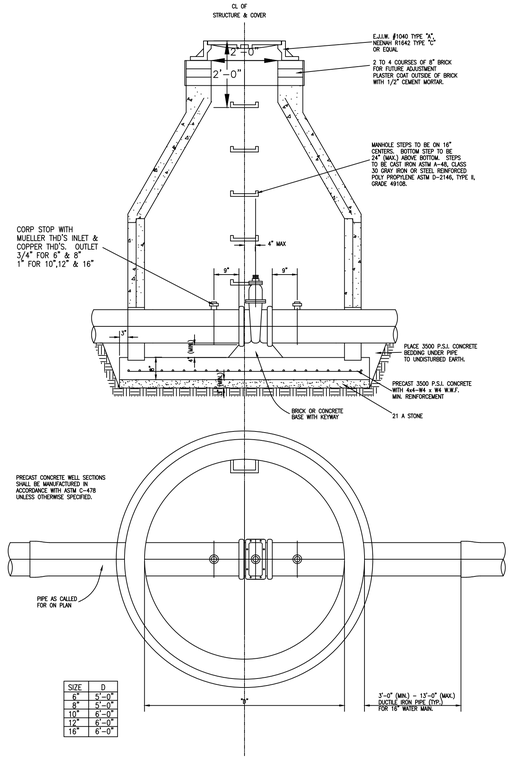
NOTE:

1. INSTALL ADDITIONAL FITTINGS & SPIGOT PIPE AS NESSARY BETWEEN WATERMAIN & VALVE BOX TO ADJUST FOR PROPER LOCATION AND GRADE OF HYDRANT.
2. VERTICAL ANCHORAGES WILL BE REQUIRED ON ALL VERTICAL HYDRANT BENDS IN EXCESS OF 11 1/4'.
3. WHERE HYDRANTS ARE INSTALLED ON EXISTING MAINS THAT ARE TO BE PLACED BACK INTO SERVICE IMMEDIATELY, PLACE CONC. BRICK OR BLOCK TO UNDISTURBED EARTH AND ENCASE WITH CONC. OR USE RESTRAINING GLANDS.
4. ALL FITTINGS TO BE MECHANICAL JOINTS
5. MAXIMUM DEPTH OF BURY – 8' 0"





STANDARD HYDRANT SETTING

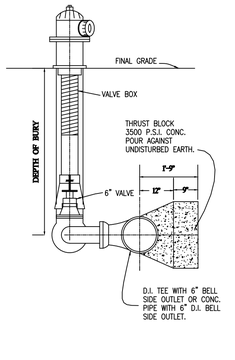


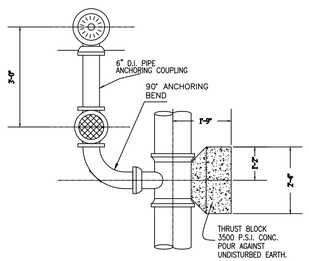
SIZE	D
6"	5'-0"
8"	5'-0"
10"	6'-0"
12"	6'-0"
16"	6'-0"

STANDARD 6' TO 16' PRECAST GATE VALVE AND WELL

NOTE:

1. INSTALL ADDITIONAL FITTINGS & SPIGOT PIPE AS NESSARY BETWEEN WATERMAIN & VALVE BOX TO ADJUST FOR PROPER LOCATION AND GRADE OF HYDRANT.
2. VERTICAL ANCHORAGES WILL BE REQUIRED ON ALL VERTICAL HYDRANT BENDS IN EXCESS OF 11 1/4'.
3. WHERE HYDRANTS ARE INSTALLED ON EXISTING MAINS THAT ARE TO BE PLACED BACK INTO SERVICE IMMEDIATELY, PLACE CONC. BRICK OR BLOCK TO UNDISTURBED EARTH AND ENCASE WITH CONC. OR USE RESTRAINING GLANDS.
4. ALL FITTINGS TO BE MECHANICAL JOINTS
5. MAXIMUM DEPTH OF BURY – 8' 0"

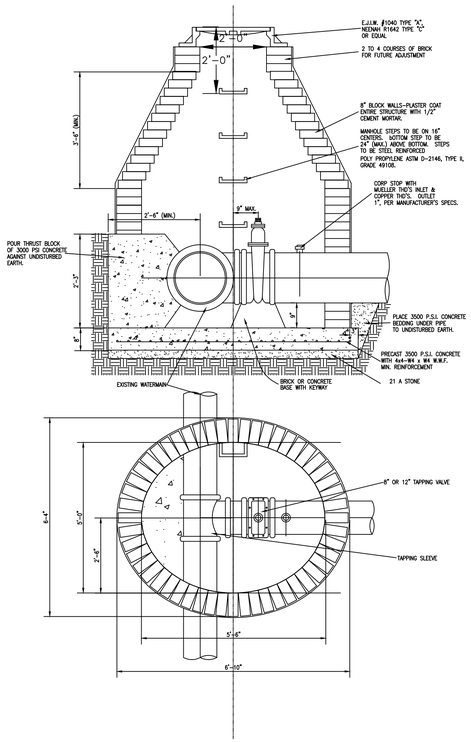




CLOSE COUPLE HYDRANT SETTING

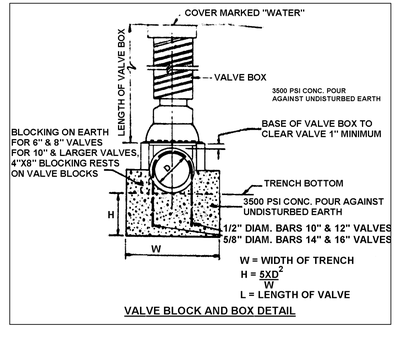
NOTE:

MECHANICAL JOINT FITTINGS FOR ALL HYDRANT INSTALLATIONS SHALL BE SWIVEL FITTINGS AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL

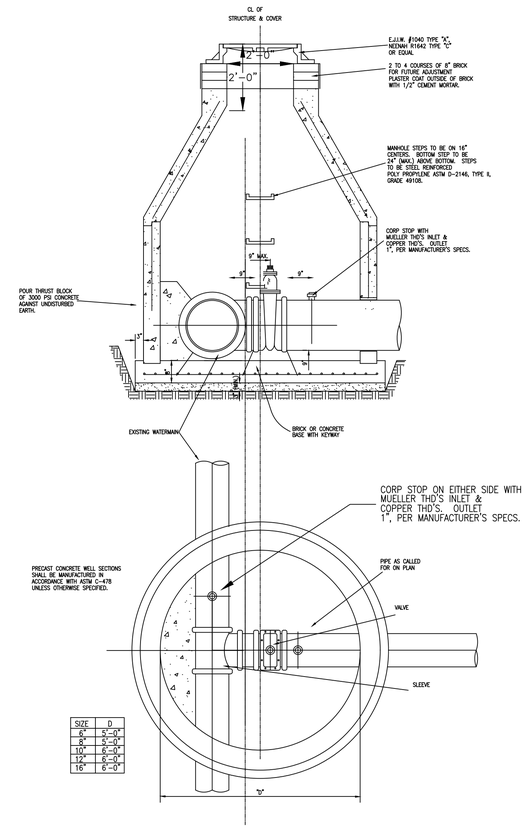


STANDARD 8" TO 12" TAPPING SLEEVE, VALVE AND WELL

(BLOCK STRUCTURES TO BE USED ONLY IN SPECIAL CIRCUMSTANCES APPROVED BY THE CITY)

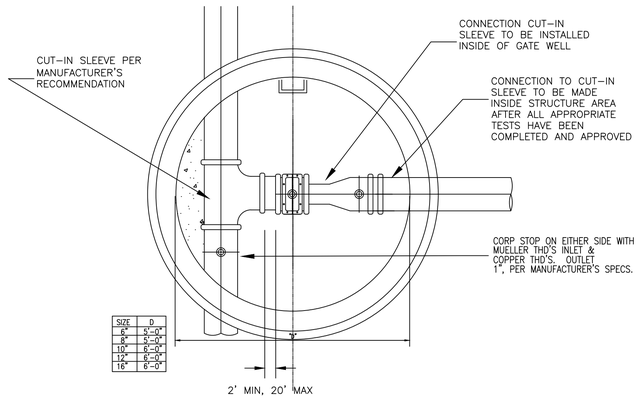


VALVE BLOCK AND BOX DETAIL



SIZE	D
6"	5'-0"
8"	5'-0"
10"	6'-0"
12"	6'-0"
16"	6'-0"

STANDARD 6' TO 16' PRECAST TAPPING SLEEVE VALVE AND WELL



SIZE	D
6"	5'-0"
8"	5'-0"
10"	6'-0"
12"	6'-0"
16"	6'-0"

CUT-IN SLEEVE, VALVE, AND WELL

PROJECT NUMBER: —

DATE: 03/29/05

SCALE: NTS

DESIGNED BY: ES

DRAWN BY: ES

CHECKED BY:

APPROVED BY:

REVISIONS

PER CITY 09/08/06

REVISED CASTINGS 10/12/15

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SOUTHGATE, MI 48195
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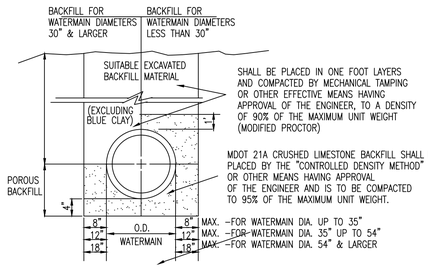
FAX (734) 282-6566
WWW.HENGINEERS.COM

TITLE STANDARD WATER DETAILS

CITY OF BBELLEVILLE
WAYNE COUNTY, MICHIGAN

SHEET C7.2

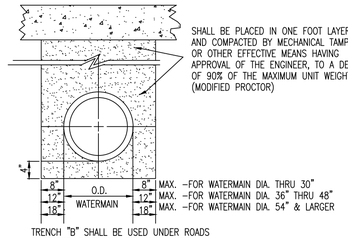


TRENCH "A"

SEWER TRENCH "A"

NOTE:
PVC PIPE:
MIN. TRENCH WIDTH = 1.5 X O.D.+12" (FOR ALL INSTALLATION DEPTHS)

HDPE PIPE:
MIN. TRENCH WIDTH=O.D.+36"
(FOR INSTALLATION DEPTHS UP TO 10')
MIN. TRENCH WIDTH=3XO.D.
(FOR INSTALLATION DEPTHS BELOW 10')
(O.D. = OUTSIDE DIAMETER OF PIPE)



TRENCH "B" SHALL BE USED UNDER ROADS SURFACES, PAVEMENT, SIDEWALK, CURB, AGGREGATE AND PAVED DRIVES AND WHERE THE EDGE OF TRENCH IS WITHIN 3 FEET OF THE PAVEMENT.

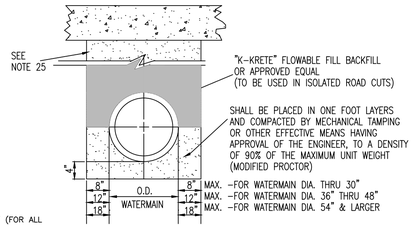
TRENCH "B"

SEWER TRENCH "B"

NOTE:
PVC PIPE:
MIN. TRENCH WIDTH = 1.5 X O.D.+12" (FOR ALL INSTALLATION DEPTHS)

HDPE PIPE:
MIN. TRENCH WIDTH=O.D.+36"
(FOR INSTALLATION DEPTHS UP TO 10')
MIN. TRENCH WIDTH=3XO.D.
(FOR INSTALLATION DEPTHS BELOW 10')
(O.D. = OUTSIDE DIAMETER OF PIPE)

TRENCH "B" SHALL BE USED UNDER ROADS SURFACES, PAVEMENT, SIDEWALK, CURB, AGGREGATE AND PAVED DRIVES AND WHERE THE EDGE OF TRENCH IS WITHIN THREE (3') OF THE PAVEMENT.

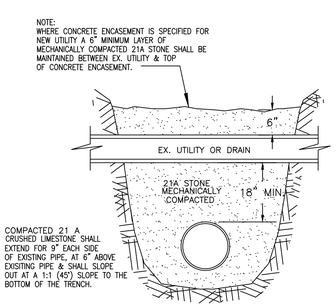


TRENCH "C"

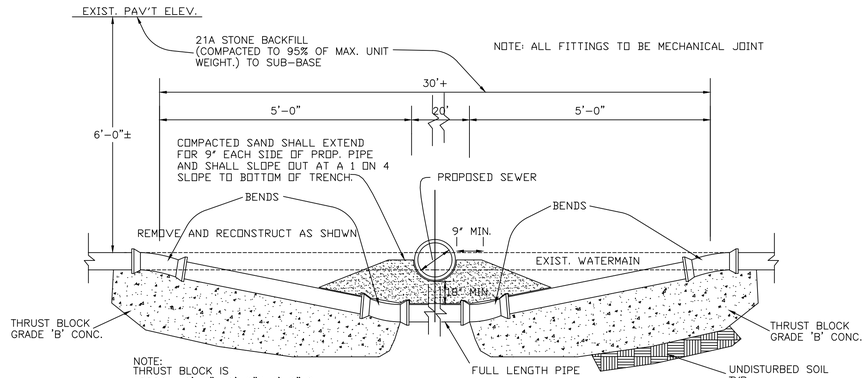
NOTE:
PVC PIPE:
MIN. TRENCH WIDTH = 1.5 X O.D.+12"
(FOR ALL INSTALLATION DEPTHS)

HDPE PIPE:
MIN. TRENCH WIDTH=O.D.+36"
(FOR INSTALLATION DEPTHS UP TO 10')
MIN. TRENCH WIDTH=3XO.D.
(FOR INSTALLATION DEPTHS BELOW 10')
(O.D. = OUTSIDE DIAMETER OF PIPE)

MAX WIDTH OF TRENCH 12" ABOVE TOP OF PIPE
6" THRU 12" PIPE 30" WIDE
15" THRU 36" PIPE O.D. +16"
42" THRU 60" PIPE O.D. +24"
MIN WIDTH OF TRENCH 12" ABOVE TOP OF PIPE SHALL BE 6" ON EACH SIDE OF PIPE

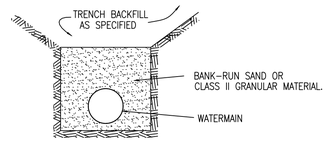


STANDARD PIPE SUPPORT



WATERMAIN LOWERING DETAIL

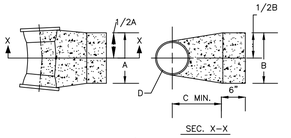
NOTE: ALL WATERMAIN FITTINGS ARE TO BE MECHANICAL JOINTS USING CORE-BLUE BOLTS.



MAXIMUM WIDTH OF TRENCH 12" ABOVE TOP OF PIPE
6" THRU 12" PIPE = 30" WIDE 16" THRU 36" PIPE = O.D. + 16"
MINIMUM WIDTH OF TRENCH 12" ABOVE THE TOP OF PIPE SHALL BE 6" ON EACH SIDE OF PIPE

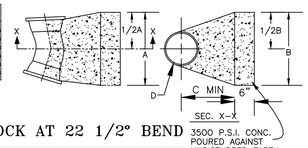
WATERMAIN BEDDING DETAIL

DIA. OF WATERMAIN	THRUST BLOCK A	B	C
D			
6"	1'-6"	1'-0"	1'-0"
8"	1'-9"	1'-3"	1'-0"
10" & 12"	3'-0"	1'-6"	1'-3"
14" & 16"	4'-0"	2'-0"	1'-6"
18" & 20"	4'-0"	3'-0"	1'-9"
24"	4'-0"	4'-6"	2'-0"



THRUST BLOCK AT 11 1/4° BEND

DIA. OF WATERMAIN	THRUST BLOCK A	B	C
D			
6"	1'-6"	1'-0"	1'-0"
8"	1'-9"	1'-3"	1'-0"
10" & 12"	3'-0"	1'-6"	1'-3"
14" & 16"	4'-0"	2'-0"	1'-6"
18" & 20"	4'-0"	3'-0"	1'-9"
24"	4'-0"	4'-6"	2'-0"

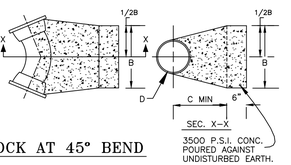


THRUST BLOCK AT 22 1/2° BEND

3500 P.S.I. CONC. POURED AGAINST UNDISTURBED EARTH.

DIA. OF WATERMAIN	THRUST BLOCK A	B	C
D			
6"	2'-0"	1'-6"	1'-0"
8"	2'-0"	2'-0"	1'-3"
10" & 12"	3'-6"	2'-6"	1'-6"
14" & 16"	5'-6"	3'-0"	1'-9"
18" & 20"	6'-6"	4'-0"	2'-0"
24"	7'-0"	5'-0"	2'-0"

NOTE:
WHEN "A" DIMENSION IS 6'-0" OR GREATER, USE N°4 BARS AT 12" CENTERS EACH WAY.

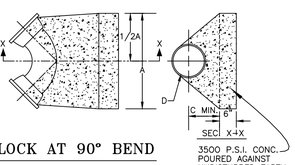


THRUST BLOCK AT 45° BEND

3500 P.S.I. CONC. POURED AGAINST UNDISTURBED EARTH.

DIA. OF WATERMAIN	THRUST BLOCK A	B	C
D			
6"	2'-9"	1'-6"	1'-0"
8"	3'-0"	2'-6"	1'-0"
10" & 12"	5'-6"	3'-0"	1'-3"
14" & 16"	6'-6"	4'-0"	1'-6"
18" & 20"	9'-0"	5'-0"	1'-9"
24"	11'-0"	6'-0"	2'-0"

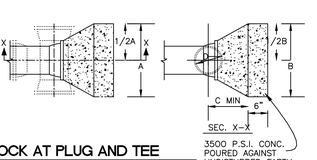
NOTE:
WHEN "A" DIMENSION IS 6'-0" OR GREATER, USE N°4 BARS AT 12"



THRUST BLOCK AT 90° BEND

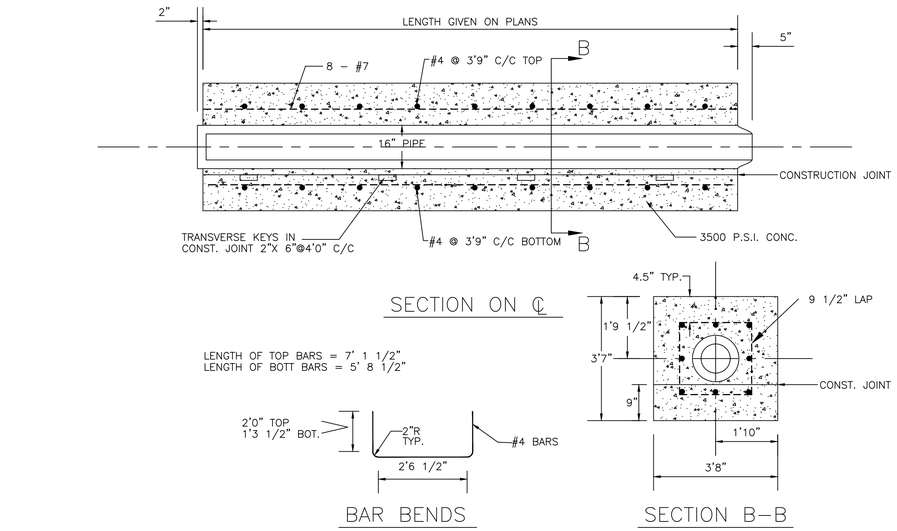
3500 P.S.I. CONC. POURED AGAINST UNDISTURBED EARTH.

DIA. OF WATERMAIN	THRUST BLOCK A	B	C
D			
6"	2'-0"	1'-9"	1'-0"
8"	2'-6"	2'-0"	1'-0"
10" & 12"	4'-0"	3'-0"	1'-3"
14" & 16"	5'-0"	4'-0"	1'-6"
18" & 20"	8'-0"	4'-0"	1'-9"
24"	9'-0"	5'-0"	2'-0"



THRUST BLOCK AT PLUG AND TEE

3500 P.S.I. CONC. POURED AGAINST UNDISTURBED EARTH.

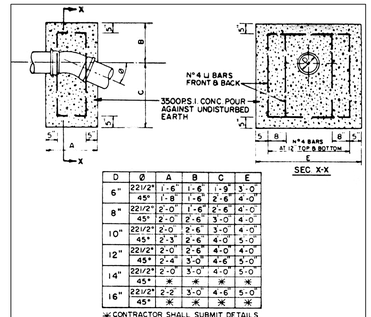


16" W.M. ENCASEMENT UNDER DRAINS AND DITCHES

(MINIMUM DEPTH OF BURY FROM BOTTOM OF DRAIN TO TOP OF PIPE "EXCLUDING MUCK" IS 5.5')

NOTE: THESE TABLES ARE BASED ON SOIL BEARING OF 1500 P.S.F. IN MUCK, PEET OR OTHER UNSUITABLE SOILS HAVING A SOIL BEARING LESS THAN 1500 P.S.F., THE CONTRACTOR SHALL PROVIDE SUITABLE ADDITIONAL BLOCKING, ENCASEMENTS OR RESTRAINTS. BLOCKING IN BORE PIT EXCAVATIONS SHALL BE AGAINST UNDISTURBED SOIL OR SHALL BE PROVIDED WITH RESTRAINTS AS REQUIRED.

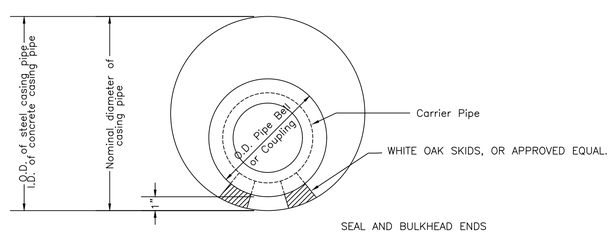
MINIMUM NOMINAL SIZE OF CASING	
Nominal Size of Utility	Cast Iron or Ductile Iron (Inches)
6"	18
8"	20
10"	24
12"	24
14"	30
15"	
16"	30
18"	30
20"	36
21"	
24"	42
27"	
30"	
36"	
42"	
48"	



D	Ø	A	B	C	E
6"	22½°	1'-6"	1'-6"	1'-9"	3'-0"
	45°	1'-8"	1'-6"	2'-6"	4'-0"
8"	22½°	2'-0"	1'-6"	2'-6"	4'-0"
	45°	2'-0"	2'-6"	3'-0"	4'-0"
10"	22½°	2'-0"	2'-6"	3'-0"	4'-0"
	45°	2'-3"	2'-6"	4'-0"	5'-0"
12"	22½°	2'-0"	2'-6"	4'-0"	4'-0"
	45°	2'-6"	3'-0"	4'-6"	5'-0"
14"	22½°	2'-0"	3'-0"	4'-0"	5'-0"
	45°	*	*	*	*
16"	22½°	2'-2"	3'-0"	4'-6"	5'-0"
	45°	*	*	*	*

*CONTRACTOR SHALL SUBMIT DETAILS OF RESTRAINED JOINTS TO ENGINEER PRIOR TO USE.

ANCHORAGE DETAILS FOR VERTICAL BENDS



RECOMMENDED CASING SIZE FOR UTILITIES UNDER CITY ROADS

PROJECT NUMBER: —
DATE: 03/29/05
SCALE: NTS
DESIGNED BY: ES
DRAWN BY: ES
CHECKED BY:
APPROVED BY:

REVISIONS

PER CITY 09/08/06

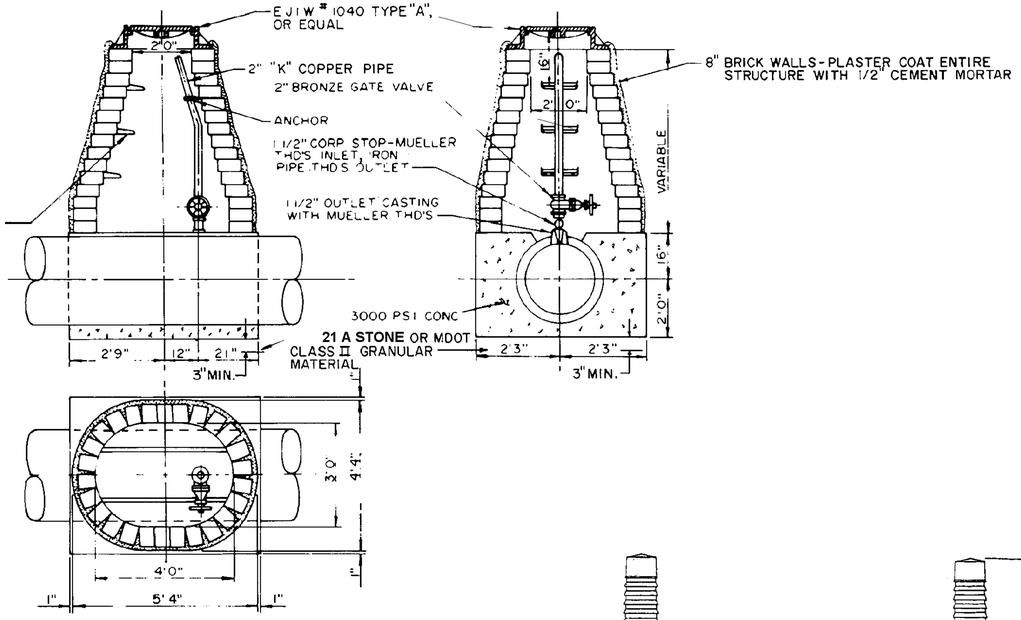
REVISED CASTINGS 10/12/15

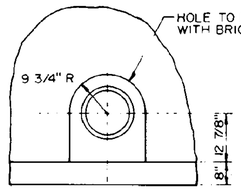
ENGINEERING THE FUTURE.
13500 REECK ROAD
SOUTHGATE, MI 48195
(734) 759-1600
FAX (734) 282-6566
WWW.HENGINEERS.COM
HENNESSEY ENGINEERS, INC.

TITLE STANDARD WATER DETAILS
CITY OF BELLEVILLE
WAYNE COUNTY, MICHIGAN

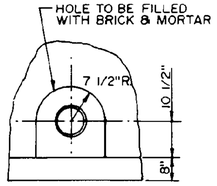
SHEET C7.3

MANHOLE STEPS TO BE ON 16 INCH CENTERS. BOTTOM STEP TO BE 24 INCH MAX. ABOVE BOTTOM. STEPS TO BE STEEL REINFORCED POLYPROPYLENE ASTM D-2146, TYPE II, GRADE 49108.





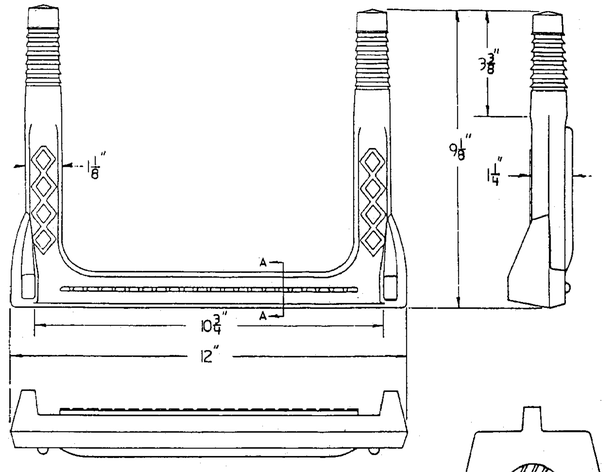
PRECAST OPENING



PRECAST OPENING

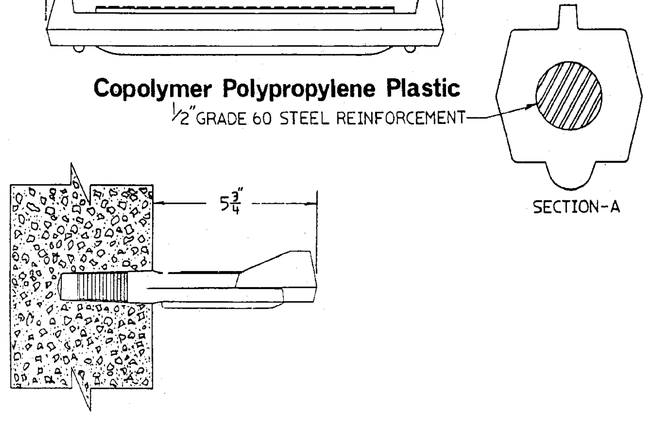
STANDARD AIR RELEASE & WELL FOR 16" & 20" WATER MAIN

USE PRECAST CONCRETE WELL. MANHOLE BLOCK WELL TO BE USED ONLY IN SPECIAL CERCUMSTANCES WITH THE APPROVAL OF THE CITY.



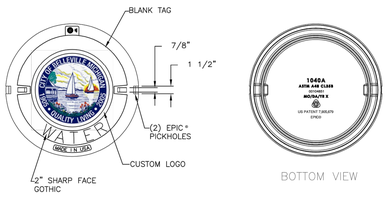
Copolymer Polypropylene Plastic

1/2" GRADE 60 STEEL REINFORCEMENT

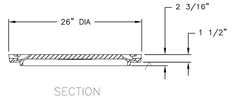


SECTION-A

1040A Cover



BOTTOM VIEW



SECTION

EPIC® DETAIL

Product Number
001040218

Design Features
-Materials
Gray Iron (CL35B)
-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Dipped
- -/ Designates Machined Surface

Certification
- ASTM A48
-
-Country of Origin:USA

Drawing Revision
6/5/2015 Designer: MAH
Revised By:

Disclaimer
Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.
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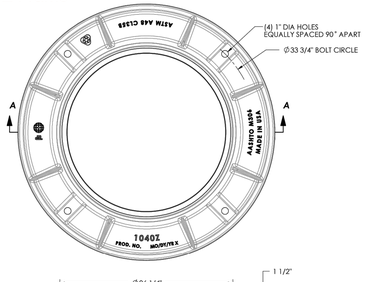
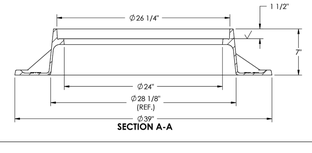
Contact
800 626 4653
ejco.com

1040Z Frame





SECTION A-A

Product Number
001040101

Design Features
-Materials
Gray Iron (CL35B)
-Design Load
Heavy Duty
-Open Area
-Coating
Dipped
-/ Designates Machined Surface

Certification
-ASTM A48
-AASHTO M306
-Country of Origin: USA

Drawing Revision
6/5/2008 Designer: JU
9/13/2013 Revised By: DEF

Disclaimer
Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.
CONFIDENTIAL: This drawing is the property of EJ GROUP, Inc., and embodies confidential information, registered marks, patents, trade secret information, and/or know how that is the property of EJ Group, Inc. Copyright © 2012 EJ Group, Inc.
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Contact
800 626 4653
ejco.com

PROJECT NUMBER: —
DATE: 03/29/05
SCALE: NTS
DESIGNED BY: ES
DRAWN BY: ES
CHECKED BY:
APPROVED BY:

REVISIONS
PER CITY 09/08/06
REVISED CASTINGS 10/12/15

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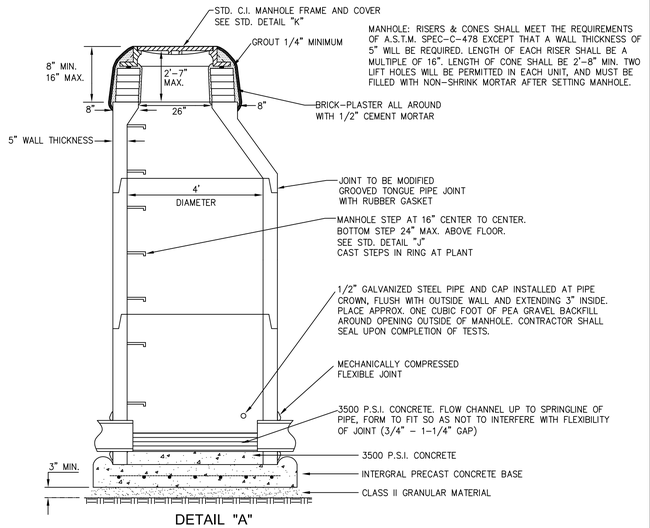
TITLE STANDARD WATER DETAILS
CITY OF BELLEVILLE
WAYNE COUNTY, MICHIGAN

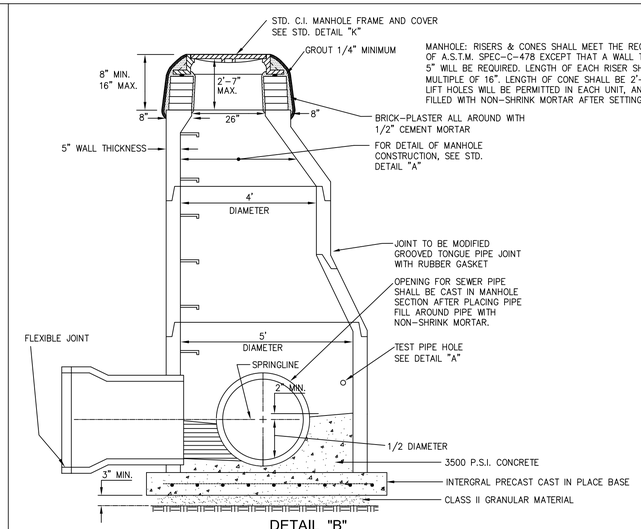
SHEET C7.4



DETAIL "A"

STANDARD MANHOLE FOR 8" TO 24" SEWERS

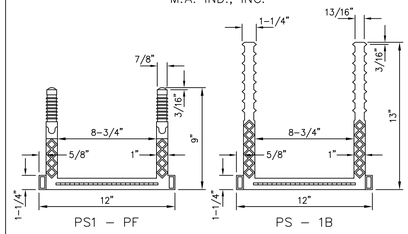
N.T.S.



DETAIL "B"

STANDARD MANHOLE FOR 27" TO 42" SEWERS

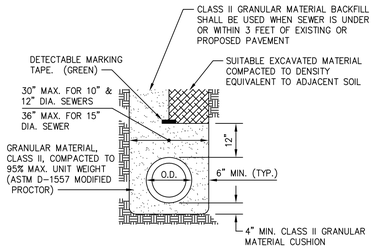
N.T.S.



DETAIL "J"

STANDARD MANHOLE STEP

N.T.S.

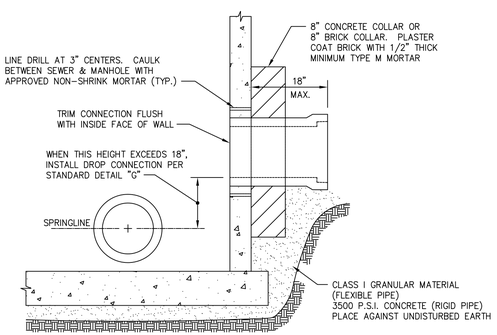


DETAIL "M"

STANDARD SEWER BEDDING CLASS "B"

N.T.S.

NOTE: EXCAVATION SHALL EXTEND AROUND ENTIRE PERIMETER OF MANHOLE, SO THAT THE DIFFERENTIAL OF EXCAVATION ON OPPOSITE SIDES DOES NOT EXCEED 6 FEET.

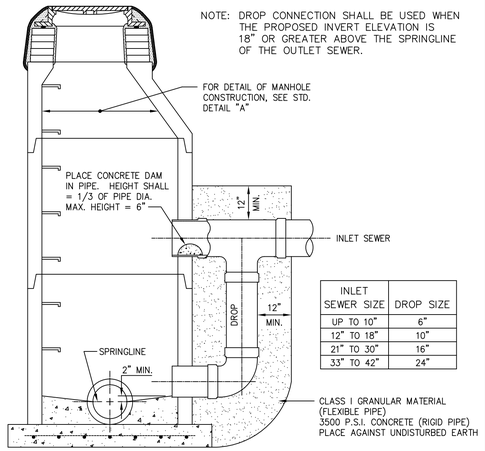


DETAIL "F"

STANDARD CONNECTION TO EXISTING MANHOLE

N.T.S.

NOTE: DROP CONNECTION SHALL BE USED WHEN THE PROPOSED INVERT ELEVATION IS 18" OR GREATER ABOVE THE SPRINGLINE OF THE OUTLET SEWER.

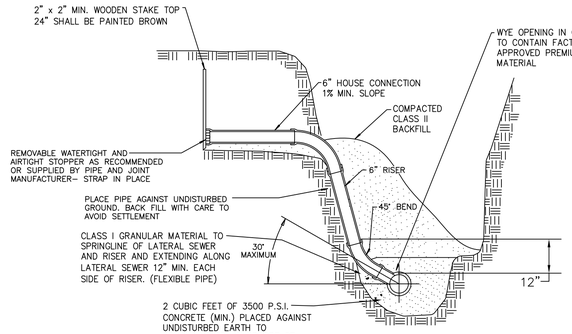


INLET SEWER SIZE	DROP SIZE
UP TO 10"	6"
12" TO 18"	10"
21" TO 30"	16"
33" TO 42"	24"

DETAIL "G"

STANDARD DROP CONNECTION AT MANHOLE

N.T.S.



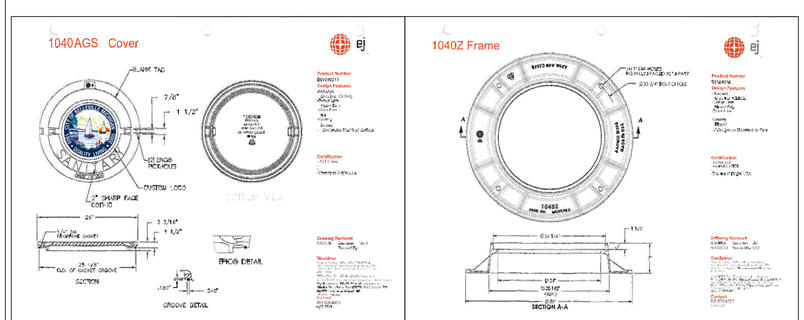
DETAIL "H"

BUILDING SEWER CONNECTION TO LATERAL TRUNK SEWERS

N.T.S.

CITY OF BELLEVILLE STANDARD SANITARY SEWER NOTES

1. ALL SANITARY SEWER PIPE IN SIZES 10-INCH TO 15-INCH SHALL BE PVC TRUSS GASKETED JOINT PIPE MEETING THE CURRENT REQUIREMENTS OF ASTM D2680-90, SDR 26 PVC PIPE MEETING ASTM 3034, A-2000 MEETING ASTM F949 AND F794 REQUIREMENTS OR ADS SANITITE HP PIPE MEETING ASTM F2736 STANDARDS. SANITARY SEWER PIPE ABOVE 18-INCHES IN DIAMETER AND GREATER SHALL BE REINFORCED CONCRETE PIPE ASTM C-76 CLASS IV MINIMUM, A-2000 ASTM F949 AND F794 FOR PIPE 18-INCHES TO 36-INCHES IN DIAMETER OR ADS SANITITE HP PIPE WHICH MEETS THE CURRENT REQUIREMENTS OF ASTM F2736 FOR PIPE UP TO 30-INCHES IN DIAMETER AND ASTM F2764 FOR PIPE DIAMETERS FROM 30-INCHES TO 60-INCHES. PIPE MATERIAL SHALL BE AS DIRECTED BY THE CITY ENGINEER AND/OR DPS DIRECTOR.
2. ALL WYES, RISERS AND BUILDING SERVICE LEADS SHALL BE 6-INCH DIAMETER SDR 23.5 OR SDR 26 PVC PIPE MEETING CURRENT ASTM D3034.
3. EACH WYE OR END OF BUILDING LEAD SHALL BE CAPPED WITH THE SAME TYPE OF MATERIAL AS THE LEAD. ALL CLEANOUTS SHALL BE J.R. SMITH #4240-S04 OR AS APPROVED EQUAL BY THE CITY ENGINEER. CLEANOUTS SHALL HAVE A MINIMUM OF A 2-FOOT X 2-FOOT CONCRETE PAD.
4. ALL SANITARY SEWER LEADS SHALL BE INSTALLED A MINIMUM OF 1-FOOT BEYOND THE RIGHT OF WAY LINE OR EASEMENT LINE AS SHOWN ON THE PLANS.
5. ALL TRENCH DETAILS FOR BOTH TRENCH A AND TRENCH B SHALL BE BASED ON THE MANUFACTURER'S RECOMMENDATIONS FOR THE GIVEN TYPE OF PIPE.
6. NO CONNECTIONS RECEIVING STORM WATER, GROUND WATER OR SURFACE WATER SHALL BE MADE TO THE SANITARY SEWER.
7. INFILTRATION FOR ANY SECTION OF SANITARY SEWER BETWEEN MANHOLES SHALL NOT EXCEED 100 GALLONS PER INCH OF DIAMETER PER MILE PER 24 HOURS.
8. NO FOOTING DRAINS SHALL BE CONNECTED TO THE SANITARY SEWER BUILDING LEAD.
9. TESTING OF ALL SANITARY SEWER SHALL BE IN ACCORDANCE WITH CURRENT SEWER USE REGULATIONS OF THE WAYNE COUNTY DEPARTMENT OF ENVIRONMENT AND WILL BE REQUIRED PRIOR TO APPROVAL BY THE CITY OF BELLEVILLE. TESTING SHALL INCLUDE: (A) TELEVISION, AND (B) AIR, INFILTRATION OR EX-FILTRATION, OR A COMBINATION OF SAME. TESTING COSTS SHALL BE BORNE BY THE CONTRACTOR.
10. TEMPORARY BULKHEADS SHALL BE INSTALLED AS DIRECTED BY THE CITY ENGINEER. THE BULKHEADS SHALL NOT BE REMOVED UNTIL SUCCESSFUL TESTING HAS BEEN COMPLETED.
11. ALL SANITARY SEWER MANHOLES SHALL BE PRECAST STRUCTURES WITH RUBBER GASKETED JOINTS FOR THE MANHOLE SECTIONS. EACH MANHOLE SECTION AND JOINT SHALL BE SEALED EXTERNALLY USING "CRETEX WRAP" EXTERNAL JOINT SEALER OR APPROVED EQUAL. ALL SANITARY SEWER MANHOLE CHIMNEYS SHALL BE SEALED WITH "WRAPID SEAL" EXTERNAL ENCAPSULATION SYSTEM. ALL SANITARY MANHOLE COVERS SHALL BE AS MANUFACTURED BY EJ (FORMERLY EAST JORDAN IRON WORKS) PRODUCT NUMBER 00104217 WITH A 1040Z FRAME.
12. ALL ELEVATIONS ARE BASED ON U.S.C. & G.S. DATUM.
13. CONTRACTOR SHALL NOTIFY WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES, ENGINEERING DIVISION, PERMIT OFFICE A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
14. HENNESSEY ENGINEERS, INC. (734-759-1600) AND THE CITY OF BELLEVILLE DEPARTMENT OF PUBLIC SERVICES AT (734-697-9323) SHALL BE NOTIFIED AT LEAST THREE (3) WORKING DAYS PRIOR TO THE START OF THE SANITARY SEWER CONSTRUCTION.
15. DIFFERENTIAL OF EXCAVATION AROUND THE EXISTING MANHOLE SHALL NOT EXCEED 6 FEET.
16. THE CONTRACTOR SHALL PLACE A TEMPORARY PLUG FOR TESTING AT LOCATIONS SHOWN ON THE PROFILE; THE PLUGS SHALL REMAIN IN PLACE UNTIL SATISFACTORY TEST RESULTS HAVE BEEN REVIEWED AND APPROVED BY THE CITY AND WCDOE.
17. THE CONTRACTOR SHALL NOTIFY THE WATER RESOURCES DIVISION OF THE SOUTHEAST MICHIGAN DISTRICT OFFICE AT (586) 753-3793 A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION OF A NEW SANITARY SEWER PROJECT.
18. THE SANITARY SEWER SHALL BE TESTED FOR DEFLECTION 30 DAYS AFTER INSTALLATION UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER. THE DEFLECTION SHALL NOT EXCEED 5% OF THE NORMAL PIPE DIAMETER. PIPE, WHICH DEFLECTS GREATER THAN 5% WILL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO ADDITIONAL CHARGER TO THE OWNER.



1.

BRICK OR BLOCK CHIMNEY TYPE EXTERIOR SEAL NOTES:

SET ELASTOMERIC "ROPE" IN WET MORTAR. CAREFULLY PLACE FRAME ON "ROPE" AND WET MORTAR. (TYPE M MORTAR.)

BACKPLASTER THE INTERIOR OF THE NEW CHIMNEY FROM 1" ABOVE THE BOTTOM OF THE FRAME TO 1" BELOW THE BOTTOM OF THE CORBAL SECTION. (1/2" MINIMUM THICKNESS, TYPE M MORTAR.)

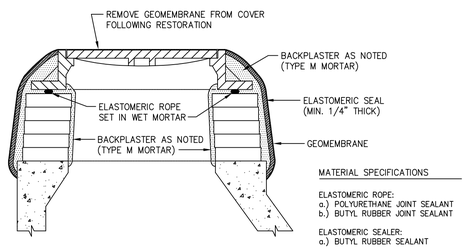
BACKPLASTER THE EXTERIOR OF THE NEW CHIMNEY FROM 1" BELOW THE TOP OF THE FRAME, OVER THE FILLET AND FLANGE AS SHOWN, TO 2" BELOW THE BOTTOM OF THE CORBAL SECTION. EXTERIOR MORTAR SURFACE SHALL BE FINISHED USING A STEEL TROWEL OR WET BRUSH TO ACHIEVE A UNIFORM AND SMOOTH FINISH. (1/2" MINIMUM THICKNESS, TYPE M MORTAR.)

REMOVE ANY DEBRIS AND/OR MORTAR DROPPINGS FROM THE INTERIOR OF THE MANHOLE WALL, STEPS, INVERT AND BENCH. CAREFULLY SET

AFTER MORTAR HAS SET, SEAL EXTERIOR MORTARED AREA WITH ELASTOMERIC SEALER. (1/4" MINIMUM THICKNESS, TROWELABLE GRADE.)

COVER THE ELASTOMERIC SEALER WITH THE GEOMEMBRANE "PANCHO" STYLE, DRAPING OVER FRAME AND COVER PRIOR TO BACKFILLING.

WHERE THE MANHOLE FRAME AND CHIMNEY IS EXPOSED (DITCH, SLOPED LAWN, etc.,) THE ELASTOMERIC SEALER SHALL BE APPLIED UP TO THE FINISH GRADE ELEVATION ONLY. FOLLOWING RESTORATION, REMOVE THE GEOMEMBRANE IN EXPOSED AREAS OF CHIMNEY AND FRAME AND COVER.



DETAIL "L"

MANHOLE EXTERIOR SEAL

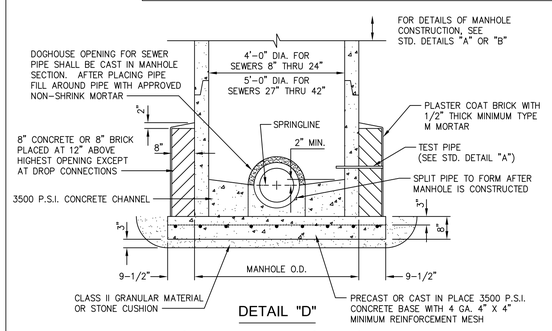
N.T.S.

MATERIAL SPECIFICATIONS

ELASTOMERIC ROPE:
a.) POLYURETHANE JOINT SEALANT
b.) BUTYL RUBBER JOINT SEALANT

ELASTOMERIC SEALER:
a.) BUTYL RUBBER SEALANT

GEOMEMBRANE:
a.) PVC GEOMETRIC 15 MIL.
b.) DOUBLE LAYER OF 6 MIL. POLYETHYLENE WRAP OR SINGLE LAYER OF 10 MIL. POLYETHYLENE WRAP.



DETAIL "D"

STANDARD MANHOLE FOR EXISTING SEWERS 8" THROUGH 42"

N.T.S.

PROJECT NUMBER:

DATE: 9/12/17

SCALE: NTS

DESIGNED BY: RSR

DRAWN BY: NKA

CHECKED BY:

APPROVED BY:

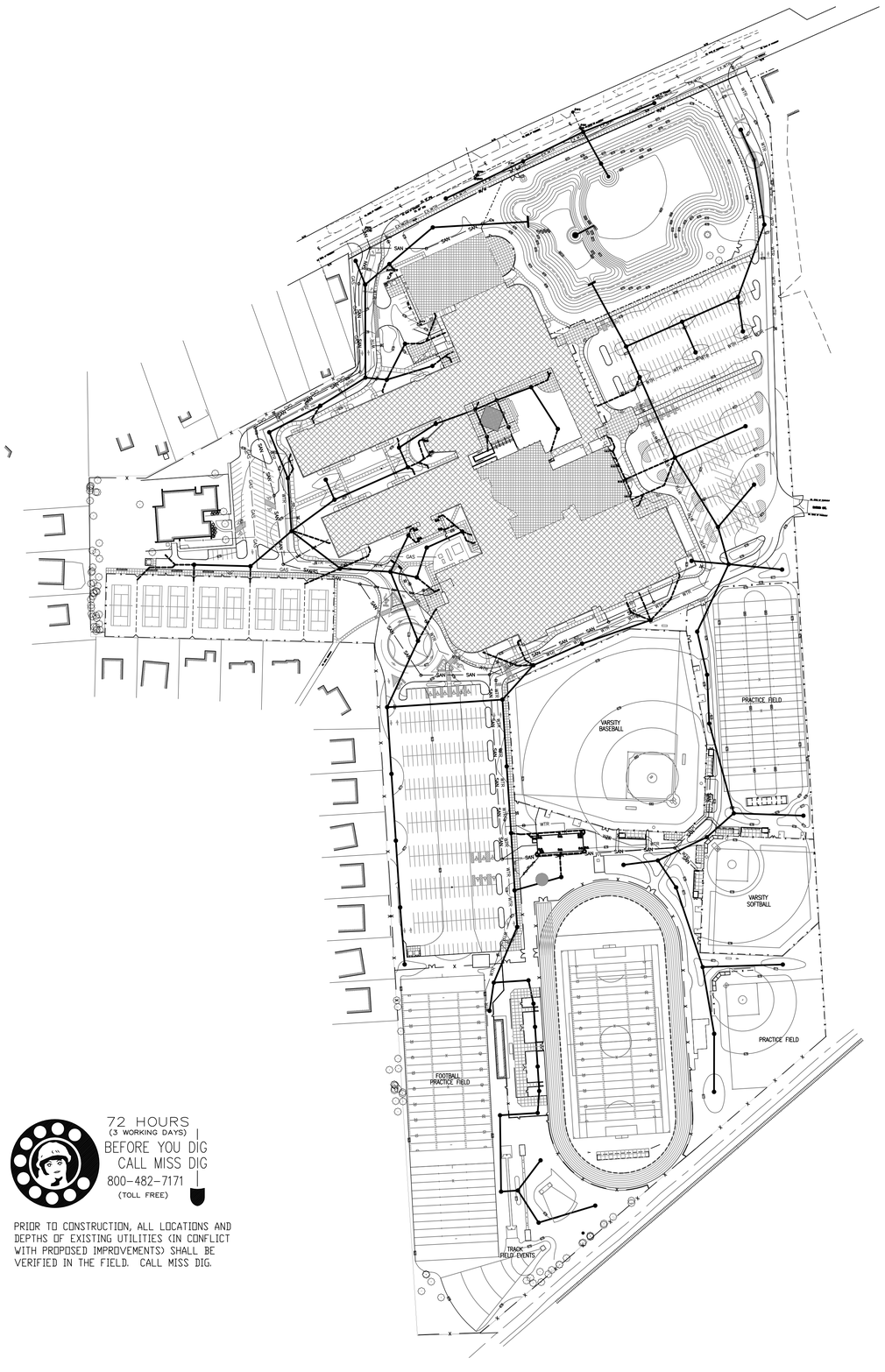
REVISIONS

ENGINEERING THE FUTURE.
HENNESSEY ENGINEERS, INC.
13500 REECK ROAD
SOUTHGATE, MI 48195
(734) 759-1600
FAX (734) 282-6566
WWW.HENGINEERS.COM

TITLE: SANITARY SEWER DETAILS

CITY OF BELLEVILLE
WAYNE COUNTY, MICHIGAN

SHEET C7.5



PROPOSED STORM STRUCTURE INFORMATION

CB #1
RIM: 676.50
12" INV: 673.80

CB #2
RIM: 677.00
12" INV: 673.47
12" INV: 673.47

CB #3
RIM: 676.50
12" INV: 673.77

CB #4
RIM: 676.50
12" INV: 673.08
15" INV: 673.08
12" INV: 673.08

CB #5
RIM: 676.50
15" INV: 672.63
18" INV: 672.63

CB #6
RIM: 677.00
12" INV: 673.17

CB #7
RIM: 677.25
12" INV: 672.50
24" INV: 671.50
18" INV: 672.00

CB #8
RIM: 678.65
24" INV: 671.39
24" INV: 671.39

CB #9
RIM: 676.75
12" INV: 673.51

CB #10
RIM: 677.25
24" INV: 671.31
24" INV: 671.31
12" INV: 672.31

CB #11
RIM: 677.75
24" INV: 671.12
24" INV: 671.12

CB #12
RIM: 677.60
24" INV: 671.01
24" INV: 671.01

CB #13
RIM: 677.00
24" INV: 670.92
24" INV: 670.92

CB #14
RIM: 676.25
12" INV: 673.05

CB #15
RIM: 676.25
12" INV: 671.76
12" INV: 671.76
24" INV: 670.76
12" INV: 671.76

CB #16
RIM: 676.25
12" INV: 673.05

CB #17
RIM: 676.25
24" INV: 670.67
24" INV: 670.67
12" INV: 671.67

CB #18
RIM: 676.25
12" INV: 673.05

CB #19
RIM: 676.25
30" INV: 669.86
24" INV: 670.36
12" INV: 671.36

CB #20
RIM: 676.75
30" INV: 669.60
30" INV: 669.60

CB #21
RIM: 676.75
12" INV: 673.56

CB #22
RIM: 676.75
12" INV: 673.37
12" INV: 673.37

CB #23
RIM: 676.75
12" INV: 672.99
12" INV: 672.99

CB #24
RIM: 676.75
24" INV: 673.54

CB #25
RIM: 676.75
12" INV: 672.55
12" INV: 672.55
15" INV: 672.55

CB #26
RIM: 676.75
12" INV: 673.50

CB #27
RIM: 676.75
12" INV: 672.22
15" INV: 672.22
15" INV: 672.22

CB #28
RIM: 676.75
30" INV: 669.51
15" INV: 670.76

CB #29
RIM: 677.00
12" INV: 673.75

CB #30
RIM: 677.00
12" INV: 673.45
12" INV: 673.45

CB #31
RIM: 677.00
12" INV: 673.84

CB #32
RIM: 676.75
12" INV: 673.26
12" INV: 673.26

CB #33
RIM: 677.00
12" INV: 673.18
12" INV: 673.18

CB #34
RIM: 676.75
12" INV: 672.80
15" INV: 672.80

MH #3
RIM: 677.60
15" INV: 672.64
15" INV: 672.64

CB #35
RIM: 677.00
15" INV: 672.54
18" INV: 672.54

CB #36
RIM: 677.00
18" INV: 672.46
18" INV: 672.46

CB #37
RIM: 677.00
18" INV: 672.32
18" INV: 672.32

CB #38
RIM: 677.00
18" INV: 672.24
18" INV: 672.24

CB #39
RIM: 677.25
12" INV: 673.90

MH #2
RIM: 676.60
18" INV: 672.16
18" INV: 672.16

CB #40
RIM: 677.00
12" INV: 672.54
18" INV: 672.04
30" INV: 671.04

CB #41
RIM: 676.50
30" INV: 670.93
30" INV: 670.93

CB #42
RIM: 677.00
12" INV: 672.61

CB #43
RIM: 676.75
12" INV: 672.37
30" INV: 670.87
30" INV: 670.87

CB #44
RIM: 676.50
30" INV: 670.77
30" INV: 670.77

CB #45
RIM: 676.50
30" INV: 670.66
30" INV: 670.66

CB #46
RIM: 676.80
18" INV: 670.77

CB #47
RIM: 676.50
18" INV: 670.57
18" INV: 670.57

CB #48
RIM: 676.50
18" INV: 670.40
24" INV: 670.40

CB #49
RIM: 676.25
24" INV: 670.29
30" INV: 670.54
42" INV: 669.54

CB #50
RIM: 677.40
12" INV: 673.57

CB #51
RIM: 677.00
12" INV: 673.28
12" INV: 673.28

CB #52
RIM: 676.60
15" INV: 672.95
12" INV: 672.95

CB #53
RIM: 676.50
15" INV: 672.62
15" INV: 672.62

CB #54
RIM: 676.75
42" INV: 669.34
42" INV: 669.34
15" INV: 671.59

CB #55
RIM: 676.25
42" INV: 669.22
42" INV: 669.22

CB #56
RIM: 677.20
15" INV: 672.09

CB #57
RIM: 677.00
15" INV: 671.85
15" INV: 671.85

CB #58
RIM: 677.40
15" INV: 671.61
15" INV: 671.61

CB #59
RIM: 678.60
12" INV: 673.53

CB #60
RIM: 677.30
42" INV: 669.09
42" INV: 669.09
15" INV: 671.34
12" INV: 671.59

CB #61
RIM: 677.80
42" INV: 669.00
42" INV: 669.00

CB #62
RIM: 678.00
12" INV: 672.97

CB #63
RIM: 678.00
18" INV: 672.32
12" INV: 672.32

CB #64
RIM: 677.50
15" INV: 673.27
15" INV: 673.27

CB #65
RIM: 677.50
18" INV: 673.06
15" INV: 673.06

CB #66
RIM: 677.50
12" INV: 673.64

CB #67
RIM: 677.50
18" INV: 672.60
12" INV: 672.60

CB #68
RIM: 677.05
18" INV: 671.40
42" INV: 668.90
48" INV: 668.90

CB #69
RIM: 677.50
48" INV: 668.80
48" INV: 668.80

CB #70
RIM: 677.30
48" INV: 668.72
48" INV: 668.72

CB #71
RIM: 677.50
48" INV: 668.62
48" INV: 668.62

CB #72
RIM: 678.30
12" INV: 674.85

MH #4
RIM: 678.35
12" INV: 672.55
12" INV: 672.55
12" INV: 672.55

CB #73
RIM: 677.00
12" INV: 673.30

CB #74
RIM: 677.10
48" INV: 668.53
48" INV: 668.53
12" INV: 671.53

CB #75
RIM: 677.50
12" INV: 672.59

CB #76
RIM: 677.40
48" INV: 668.37
48" INV: 668.37
12" INV: 671.37

MH #1
RIM: 678.80
48" INV: 667.91
48" INV: 667.91

CB #77
RIM: 677.00
48" INV: 668.22
48" INV: 668.22

CB #78
RIM: 676.50
12" INV: 672.83

CB #79
RIM: 676.50
12" INV: 669.02
48" INV: 666.02
48" INV: 666.02

CB #80
RIM: 676.50
12" INV: 672.78

CB #81
RIM: 677.00
12" INV: 672.36
12" INV: 672.36

CB #82
RIM: 677.07
12" INV: 674.18

CB #83
RIM: 678.07
12" INV: 673.93
12" INV: 673.93

CB #84
RIM: 678.74
12" INV: 675.80

CB #85
RIM: 678.74
15" INV: 673.75
12" INV: 673.75
12" INV: 675.40

CB #86
RIM: 678.74
12" INV: 675.80

CB #87
RIM: 678.74
15" INV: 673.66
12" INV: 673.66
12" INV: 675.06

MH #88
RIM: 678.90
15" INV: 673.50
15" INV: 673.50

72 HOURS
(3 WORKING DAYS)
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES (IN CONFLICT WITH PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. CALL MISS DIG.

NORTH

OVERALL STORM SEWER LAYOUT

SCALE: 1" = 120'-0"

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BELLEVILLE, MICHIGAN

FANNING/HOWEY
248.848.0123 www.fhai.com

OVERALL STORM SEWER LAYOUT

DRAWN BY: RAB
CHECKED BY: BMM

COMM. NO.: 209035.00
DATE: APRIL 6, 2010

REVISIONS NO. DATE

SU1.0

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)

72 HOURS
(3 WORKING DAYS)
BEFORE YOU DIG
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800-482-7171
(TOLL FREE)

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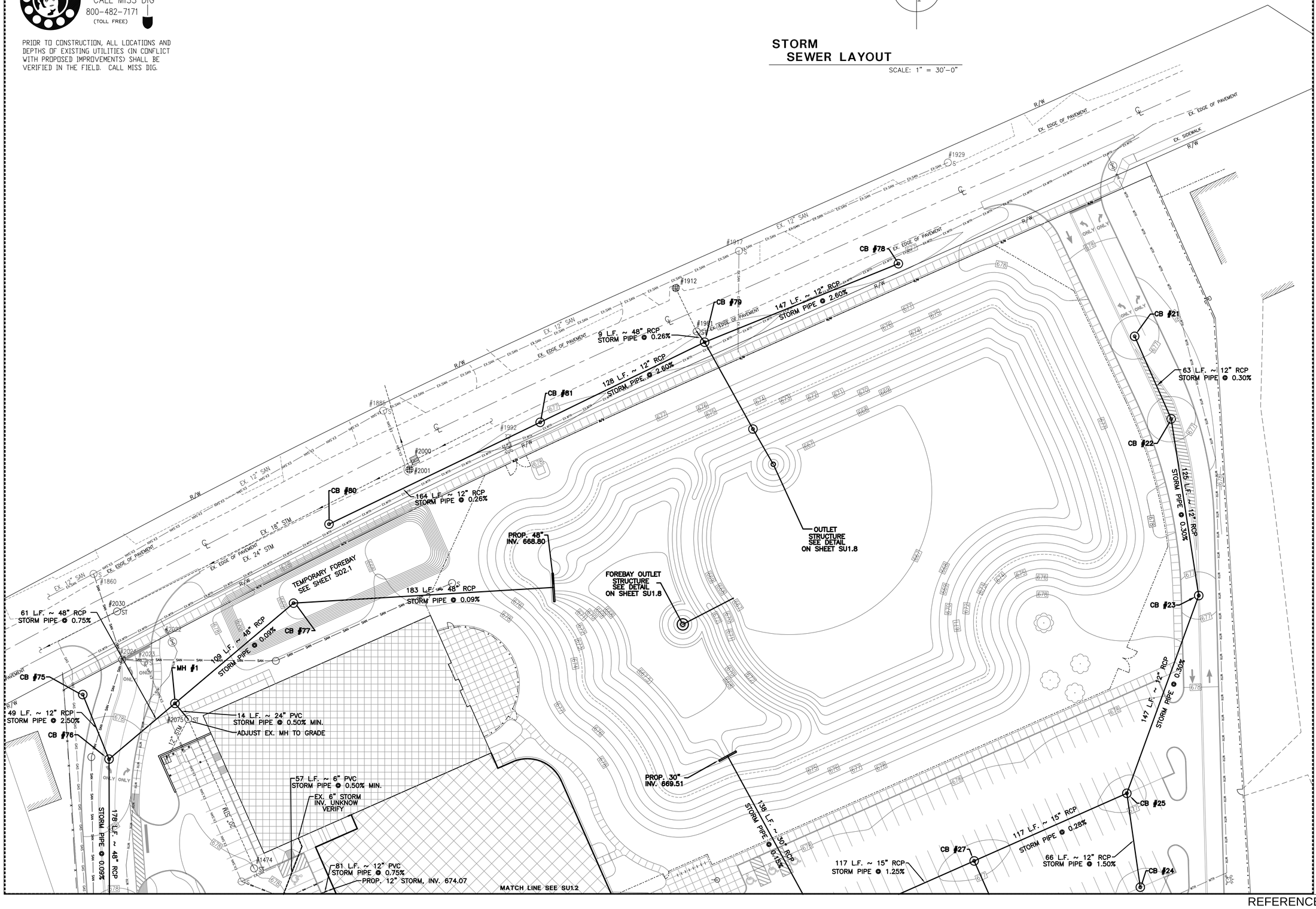
HURON

STORM SEWER LAYOUT

SCALE: 1" = 30'-0"



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STORM SEWER LAYOUT

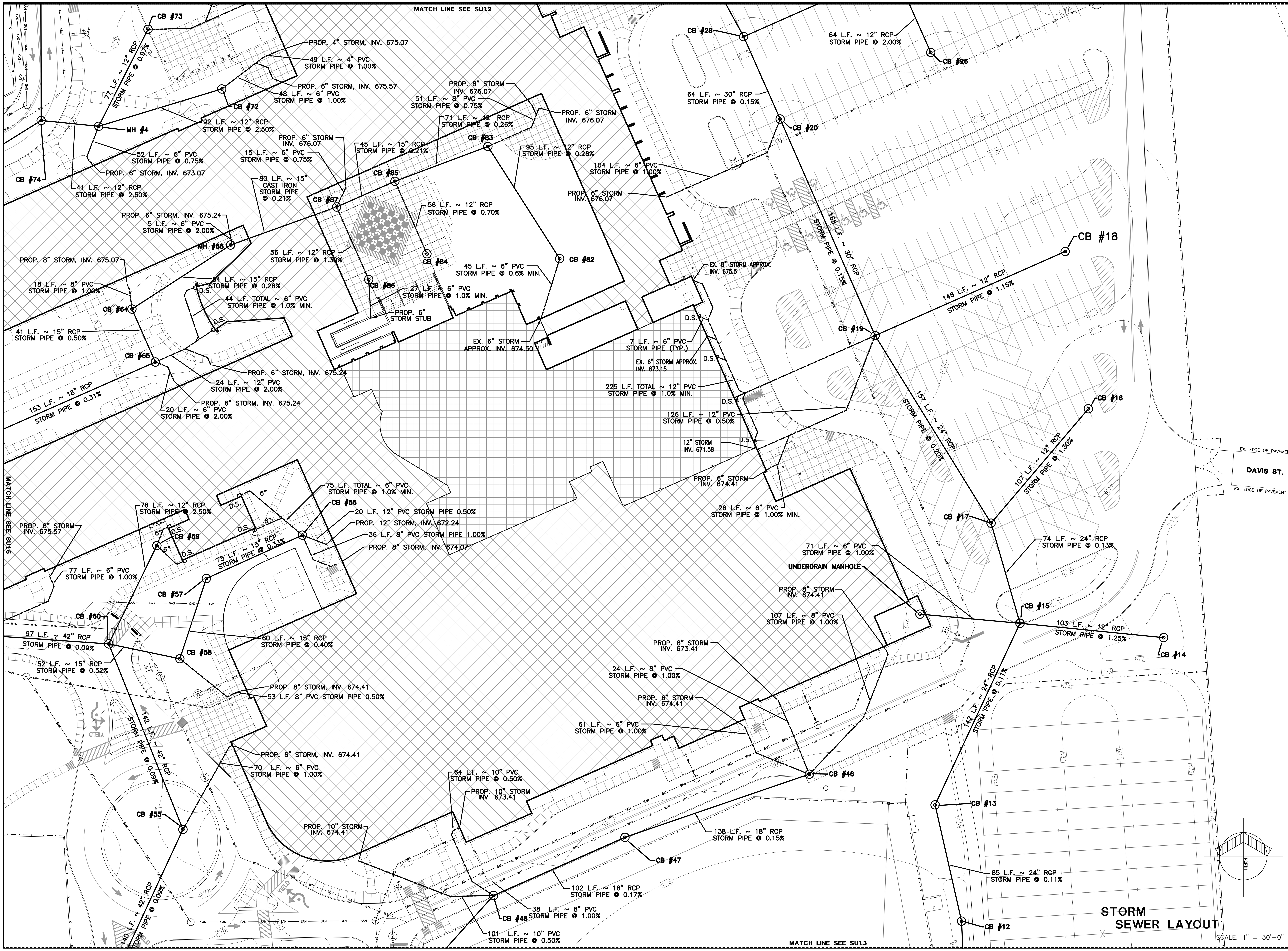
DRAWN BY: RAB
CHECKED BY: BMM
COMM. NO.: 209035.00
DATE: APRIL 6, 2010

REVISIONS NO. DATE

SU1.1

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)

REFERENCE SHEET REF STM2



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STORM SEWER LAYOUT

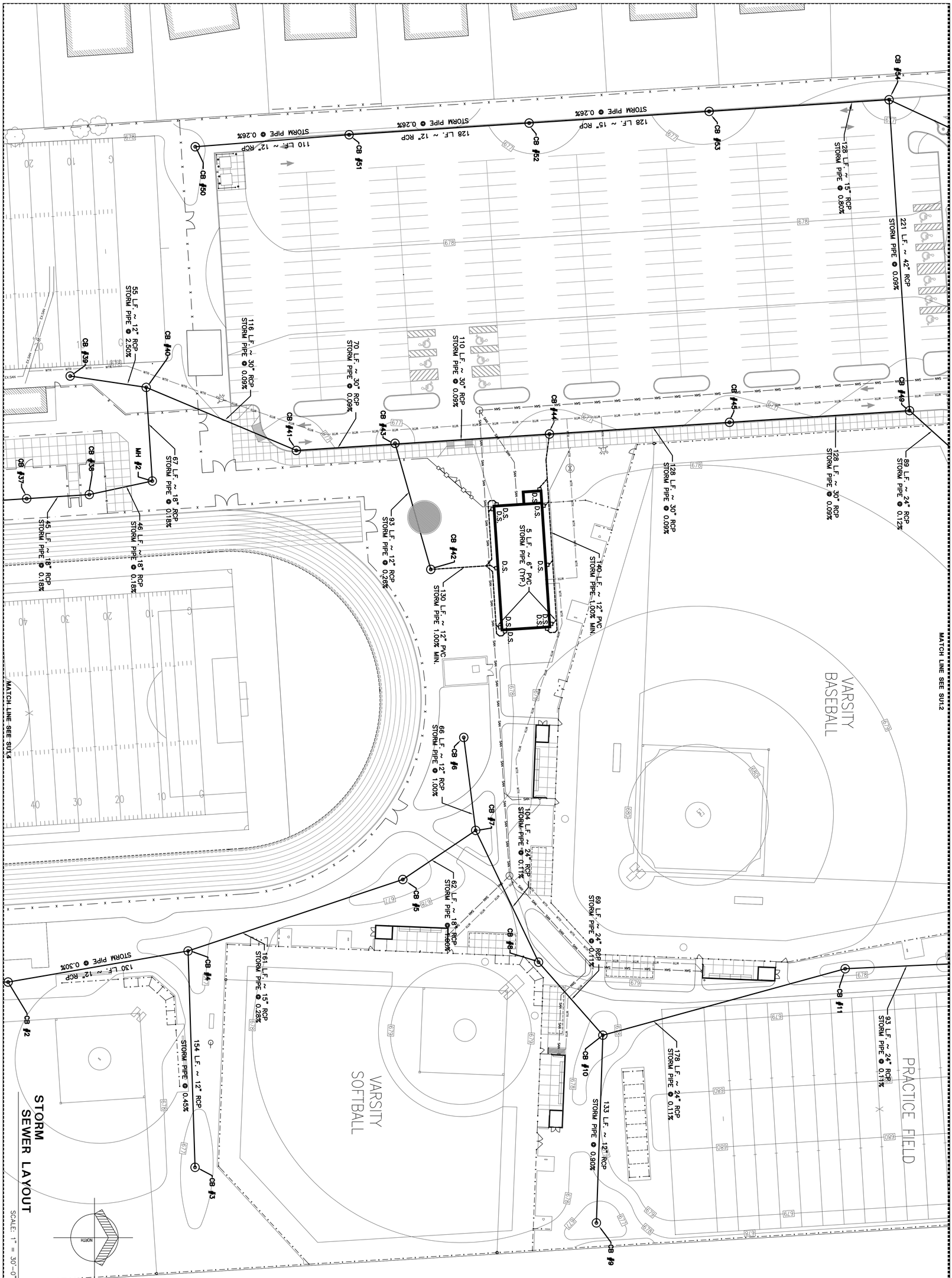
DRAWN BY: RAB
CHECKED BY: SMM
COMM. NO.: 209035.00
DATE: APRIL 6, 2010

REVISIONS NO. DATE

SU1.2

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)

REFERENCE SHEET REF STM3



STORM SEWER LAYOUT

SCALE: 1" = 30'-0"

DRAWN BY: RAB
CHECKED BY: BMM
COMM. NO.: 209035.00
DATE: APRIL 6, 2010

SU1.3

REVISIONS NO. DATE

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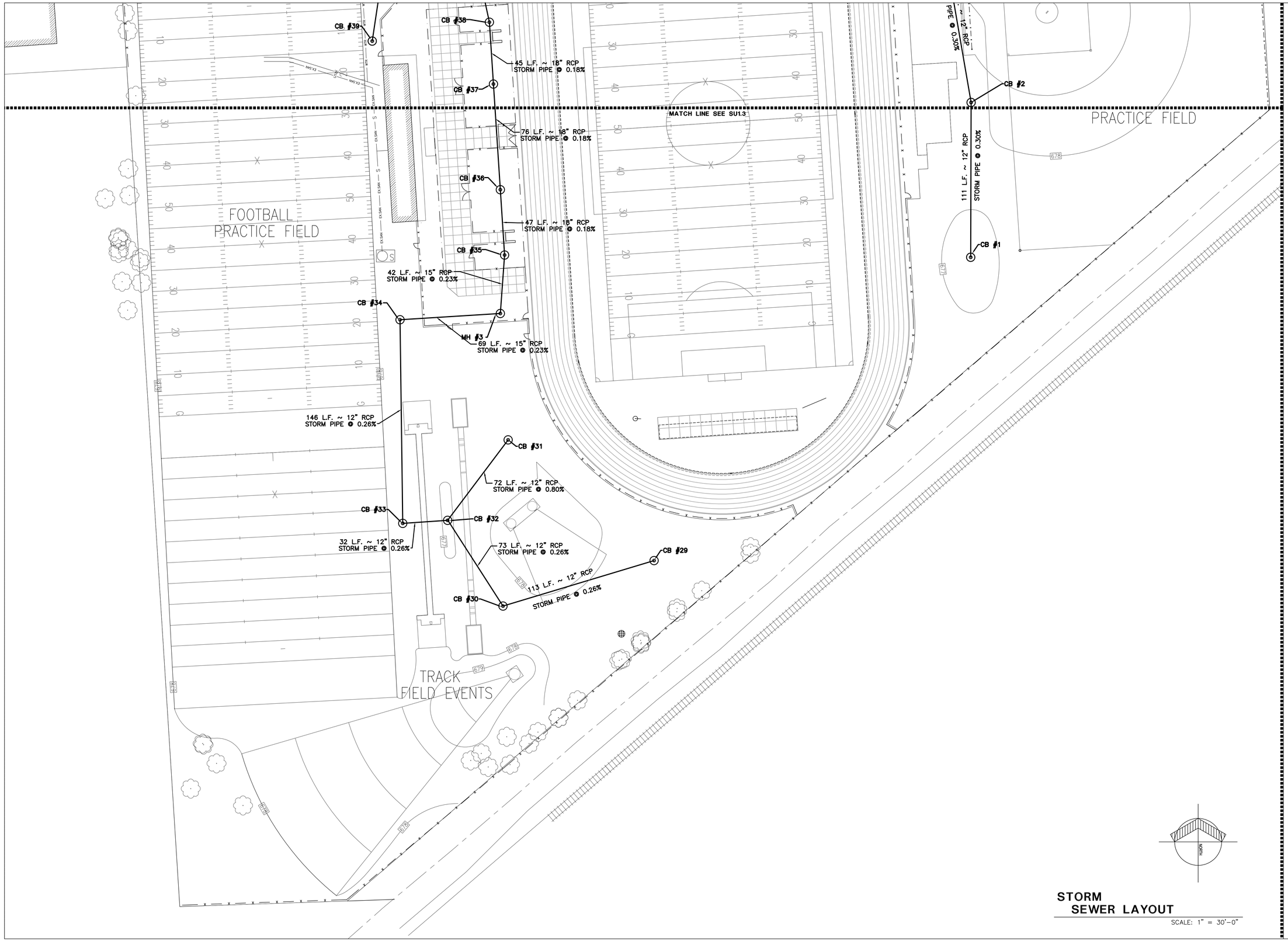
REFERENCE SHEET REF STM4



STORM SEWER LAYOUT

SCALE: 1" = 30'-0"

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STORM SEWER LAYOUT

DRAWN BY: PAB
CHECKED BY: BMM
COMM. NO.: 209035.00
DATE: APRIL 6, 2010

REVISIONS NO. DATE

SU1.4

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)

72 HOURS
(3 WORKING DAYS)
BEFORE YOU DIG
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800-482-7171
(TOLL FREE)

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STORM SEWER LAYOUT

SCALE: 1" = 30'-0"

HUDSON

102 L.F. ~ 48" RCP STORM PIPE @ 0.09%
38 L.F. ~ 6" PVC STORM PIPE @ 2.00%
CB #71
110 L.F. ~ 48" RCP STORM PIPE @ 0.09%
CB #70
95 L.F. ~ 48" RCP STORM PIPE @ 0.09%
CB #69
102 L.F. ~ 48" RCP STORM PIPE @ 0.09%
CB #68
103 L.F. ~ 18" RCP STORM PIPE @ 0.90%
CB #62
CB #63
108 L.F. ~ 12" RCP STORM PIPE @ 0.60%
CONNECT EX. 6" STORM VERIFY LOCATION APPROX. INV. 674.00
26 L.F. ~ 6" PVC STORM PIPE @ 1.00%
84 L.F. ~ 8" PVC STORM PIPE @ 1.00%
84 L.F. ~ 6" PVC STORM PIPE @ 1.00%
CONNECT. CHANNEL DRAIN TO 6" PVC STORM PIPE
CONNECT CHANNEL DRAIN TO 6" PVC STORM PIPE
31 L.F. ~ 6" PVC STORM PIPE @ 1.00%
CONNECT CHANNEL DRAIN TO 6" PVC STORM PIPE
31 L.F. ~ 6" PVC STORM PIPE @ 1.00%
CONNECT CHANNEL DRAIN TO 6" PVC STORM PIPE
74 L.F. ~ 6" PVC STORM PIPE @ 1.00%
PROP. 6" STORM INV. 675.57
PROP. 6" STORM, INV. 675.57
51 L.F. ~ 6" PVC STORM PIPE @ 1.00%
MATCH LINE SEE SU1.1
CB #73
77 L.F. ~ 12" RCP STORM PIPE @ 0.97%
PROP. 4" STORM, INV. 67
49 L.F. ~ 4" PVC STORM PIPE @ 1.00%
PROP. 6" STORM, INV. 675.57
48 L.F. ~ 6" PVC STORM PIPE @ 1.00%
CB #72
MH #4
92 L.F. ~ 12" RCP STORM PIPE @ 2.50%
52 L.F. ~ 6" PVC STORM PIPE @ 0.75%
PROP. 6" STORM, INV. 673.07
CB #74
41 L.F. ~ 12" RCP STORM PIPE @ 2.50%
PROP. 6" STORM INV. 676.07
15 L.F. ~ 6" PVC STORM PIPE @ 0.75%
45 L.F. ~ STORM PIPE
CB #8
80 L.F. ~ 15" CAST IRON STORM PIPE @ 0.21%
CB #87
PROP. 6" STORM, INV. 675.24
5 L.F. ~ 6" PVC STORM PIPE @ 2.00%
MH #88
56 L.F. ~ 12" RCP STORM PIPE @ 1.30%
PROP. 8" STORM, INV. 675.07
18 L.F. ~ 8" PVC STORM PIPE @ 1.00%
34 L.F. ~ 15" RCP STORM PIPE @ 0.28%
D.S.
CB #86
44 L.F. TOTAL ~ 6" PVC STORM PIPE @ 1.0% MIN.
CB #64
D.S.
41 L.F. ~ 15" RCP STORM PIPE @ 0.50%
CB #65
PROP. 6" STORM, INV. 675.24
24 L.F. ~ 12" PVC STORM PIPE @ 2.00%
CB #66
42 L.F. ~ 12" RCP STORM PIPE @ 2.50%
153 L.F. ~ 18" RCP STORM PIPE @ 0.31%
20 L.F. ~ 6" PVC STORM PIPE @ 2.00%
PROP. 6" STORM, INV. 675.24
CB #67
103 L.F. ~ 18" RCP STORM PIPE @ 1.17%
72 L.F. ~ 6" PVC STORM PIPE @ 1.00%
78 L.F. ~ 12" RCP STORM PIPE @ 2.50%
75 L.F. TOTAL ~ 6" STORM PIPE @ 1.0%
CB #56
20 L.F. 12"
PROP. 12"
36 L.F.
PROP. 8
D.S.
6"
CB #59
PROP. 6" STORM INV. 675.57
PROP. 6" STM INV. 675.57
75 L.F. ~ 15" RCP STORM PIPE @ 0.33%
77 L.F. ~ 6" PVC STORM PIPE @ 1.00%
CB #57
117 L.F. ~ 42" RCP STORM PIPE @ 0.09%
CB #60
CB #61
97 L.F. ~ 42" RCP STORM PIPE @ 0.09%
CB #58
60 L.F. ~ 15" RCP STORM PIPE @ 0.40%
52 L.F. ~ 15" RCP STORM PIPE @ 0.52%
PROP. 8" STORM, INV. 674.41
53 L.F. 8" PVC STORM PIPE 0.50%
YIELD
142 L.F. ~ 42" RCP STORM PIPE @ 0.09%
PROP. 6" STORM, INV. 674.41
70 L.F. ~ 6" PVC STORM PIPE @ 1.00%
CB #55
PROP. 10" STORM INV. 674.41
EX. CONC. SIDEWALK
140 L.F. ~ 42" RCP STORM PIPE @ 0.09%
MATCH LINE SEE SU1.2

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STORM SEWER LAYOUT

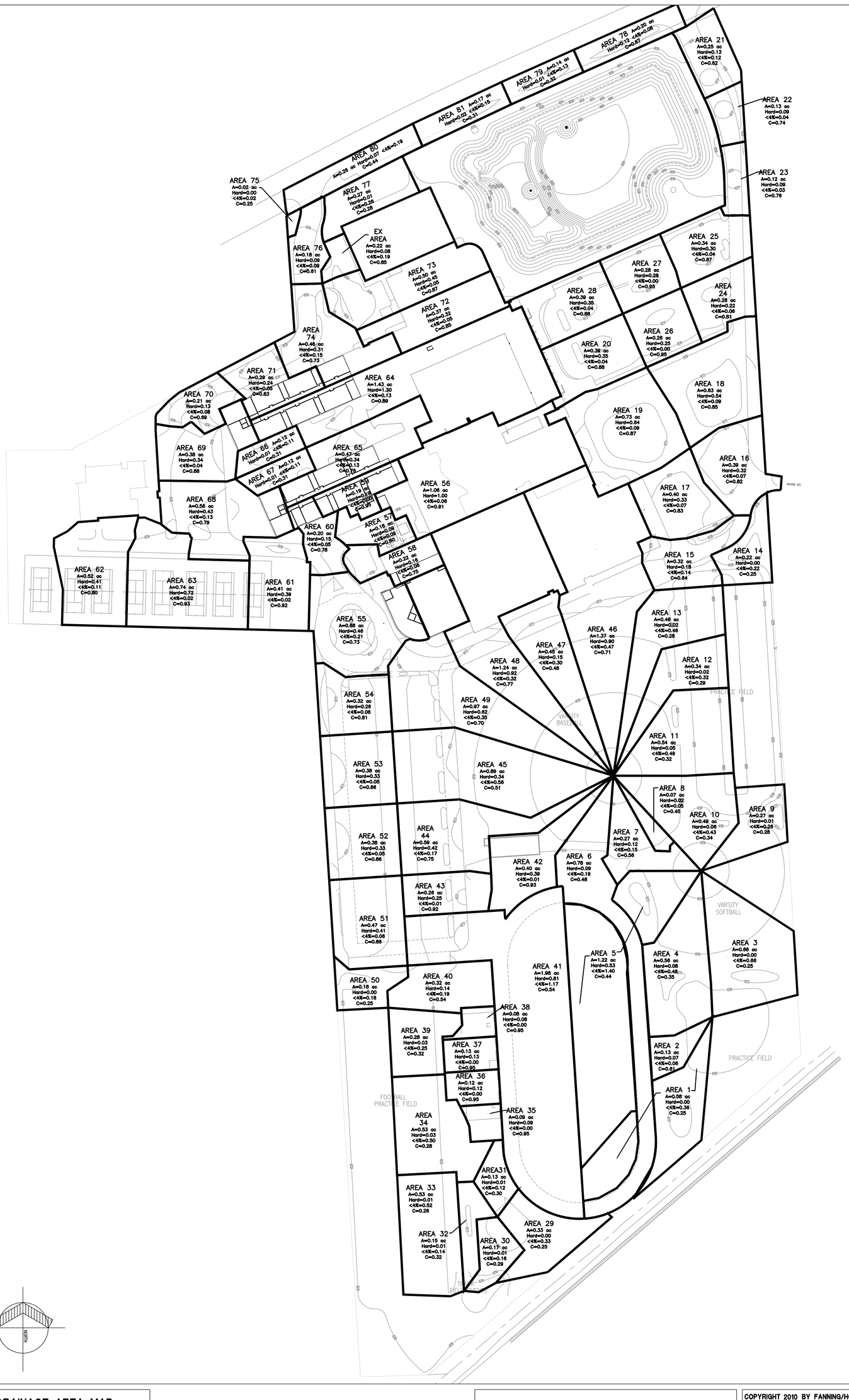
DRAWN BY: RAB
CHECKED BY: BMM
COMM. NO.: 209035.00
DATE: APRIL 6, 2010

REVISIONS NO. DATE

SU1.5

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)

REFERENCE SHEET REF STM6



DRAINAGE AREA MAP

SCALE: 1" = 80'-0"

REFERENCE SHEET REF STM7

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)

DRAINAGE AREA MAP

DRAWN BY: RAB | COMM. NO.: 209035.00
CHECKED BY: BMM | DATE: APRIL 6, 2010

SU1.6

REVISIONS NO. DATE

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(TOLL FREE)

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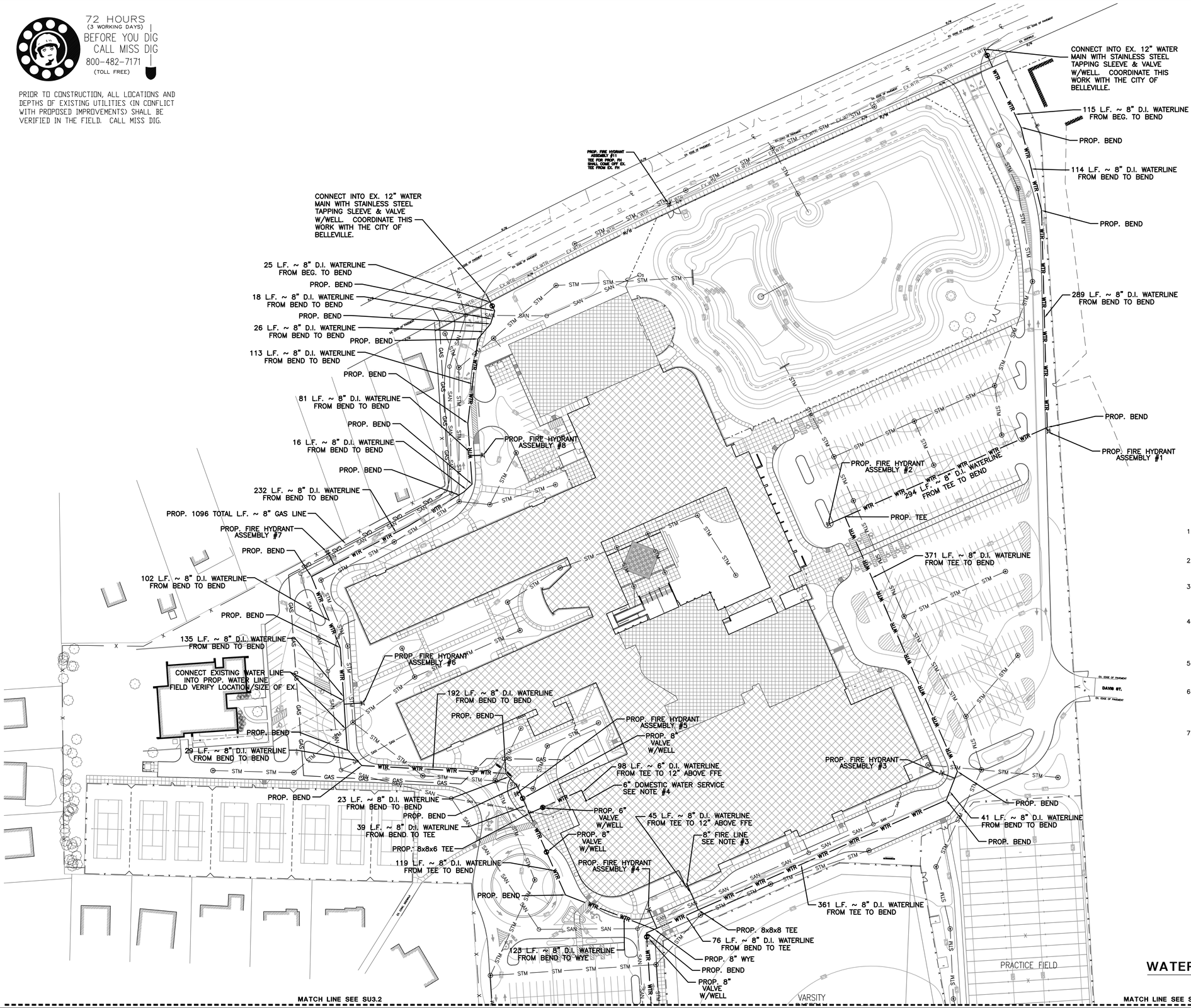

WATER / FIRE LINE NOTES:

1.) A LICENSED FIRE PROTECTION CONTRACTOR SHALL INSTALL ALL PROPOSED WATER LINES AND FIRE LINES ON SITE.

2.) ALL WATERLINES SHALL BE CLASS 54 DUCTILE IRON PIPE.

3.) 8" FIRE MAIN FROM EXTERIOR MAIN TO 12" ABOVE THE FINISH FLOOR ELEVATION WITH FLANGED CONNECTION AND BLIND FLANGE. COORDINATE EXACT LOCATION WITH THE ARCHITECT/PLUMBING.

4.) 6" WATER LINE FROM EXTERIOR MAIN TO 12" ABOVE THE FINISH FLOOR ELEVATION WITH FLANGED CONNECTION AND BLIND FLANGE. COORDINATE EXACT LOCATION WITH THE ARCHITECT/PLUMBING.

5.) 3/4" WATER LINE TO 12" ABOVE THE FINISH FLOOR ELEVATION OF DUGOUT. CORDINATE EXACT LOCATION WITH THE ARCHITECT/PLUMBING.

6.) 3" WATER LINE FROM EXTERIOR MAIN TO 12" ABOVE THE FINISH FLOOR ELEVATION WITH FLANGED CONNECTION AND BLIND FLANGE. COORDINATE EXACT LOCATION WITH THE ARCHITECT/PLUMBING.

7.) 2" WATER LINE FROM EXTERIOR MAIN TO 12" ABOVE THE FINISH FLOOR ELEVATION WITH FLANGED CONNECTION AND BLIND FLANGE. COORDINATE EXACT LOCATION WITH THE ARCHITECT/PLUMBING.

WATER LINE LAYOUT

SCALE: 1" = 60'-0"

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WATER LINE LAYOUT

DRAWN BY: BAB
CHECKED BY: BMM
COMM. NO.: 209035.00
DATE: APRIL 6, 2010

REVISIONS NO. DATE

SU3.1

BELLEVILLE HIGH SCHOOL
209035.00 (BID PACKAGE #2)